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OTIS ELEVATOR COMPANY

THE OTIS ELEVATOR INDUSTRY COMPRISES LARGE MANU-FACTURING PLANTS IN THE PRINCIPAL CITIES IN THE UNITED STATES CANADA GREAT BRITAIN GERMANY AND FRANCE.

Written and arranged by and
printed under the direction of
RAY D. LILLIBRIDGE

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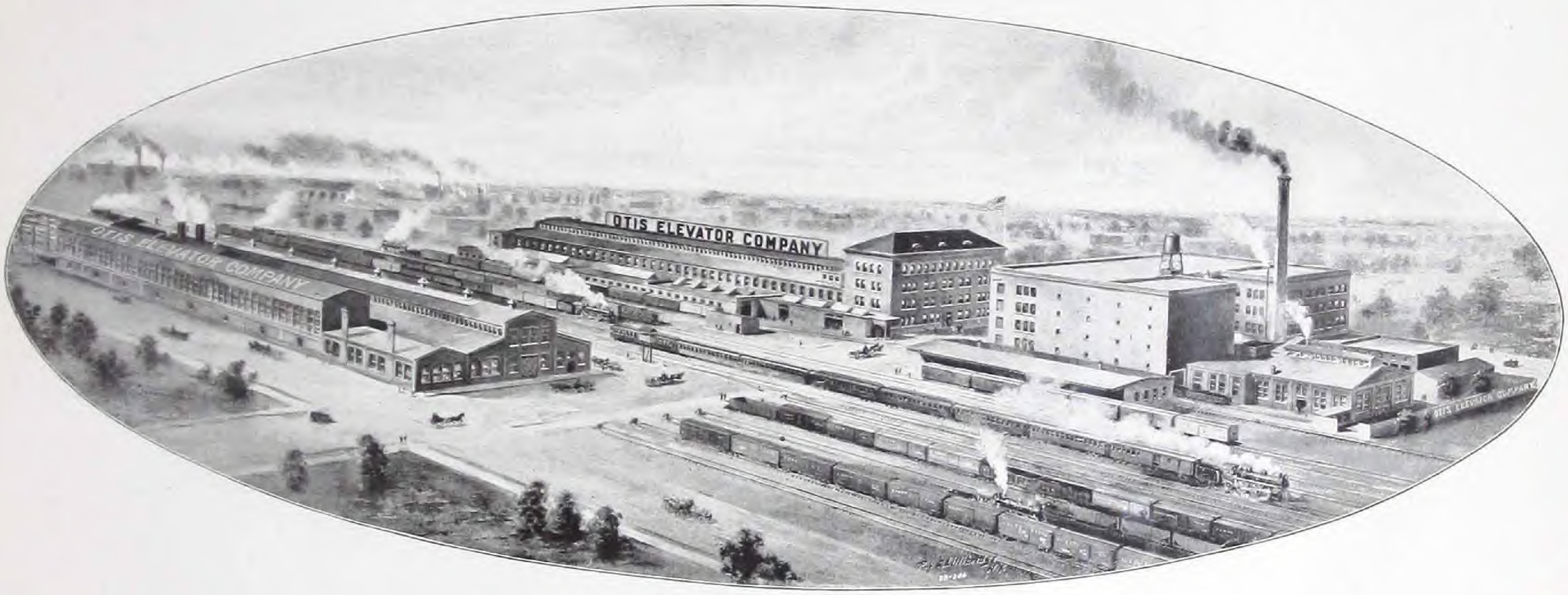

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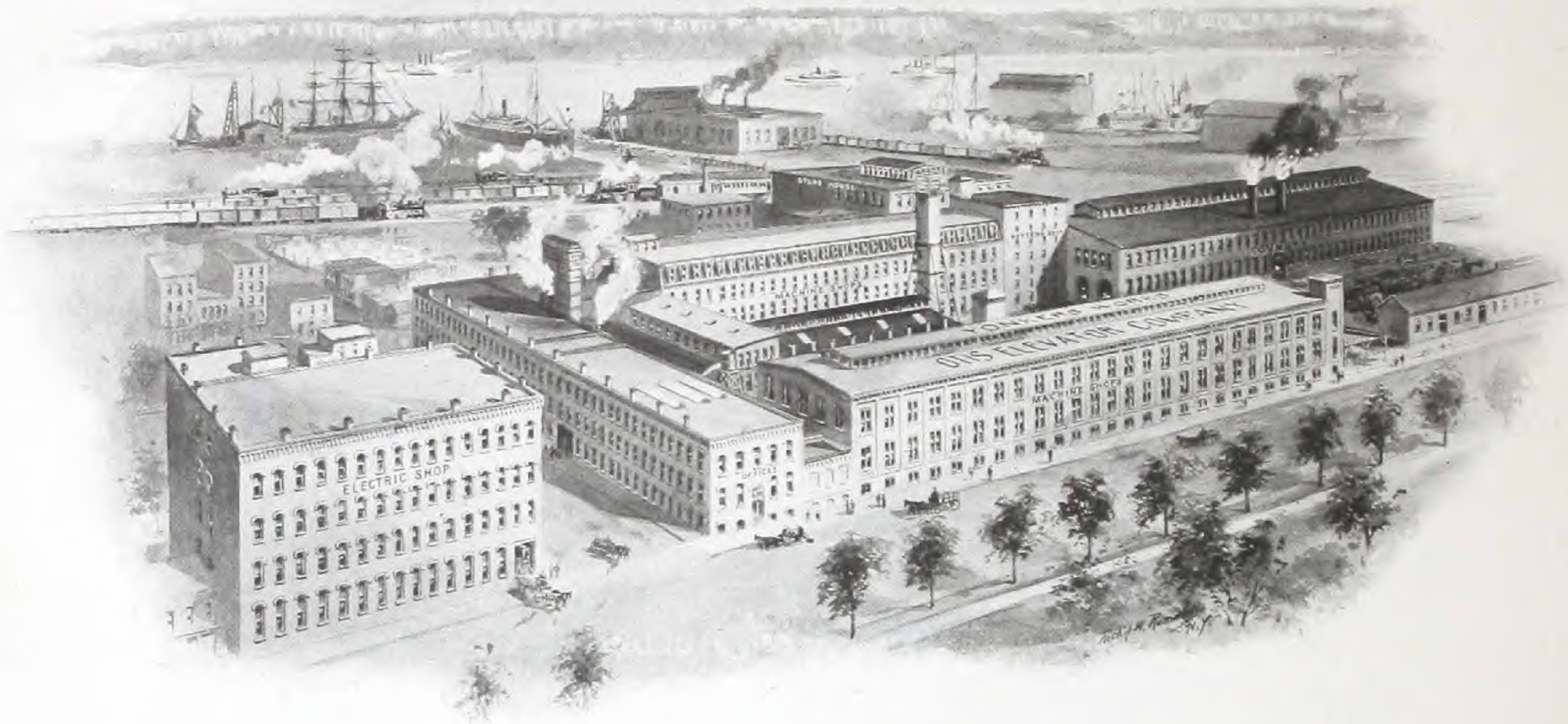


Otis Elevator Company Works at Yonkers, N. Y.

INTRODUCTORY

THE great elevator industry of the Otis Elevator Company was founded in the year 1854, quite half a century ago, by Mr. E. G. Otis. Starting in a small shop at Yonkers, N. Y., the business has expanded step by step and the original factory has developed into the great industrial establishment illustrated on page 8. With the development of the business, it has from time to time become necessary to start factories in other cities and in other countries and, in some instances, to acquire existing establishments devoted to this branch of manufacturing. With each increase of facilities and accession of engineering talent it has been possible to further improve the product. The present corporate name of "Otis Elevator Company" was adopted in 1898, and in this catalogue is presented an outline of the various types of elevating devices which are manufactured by that great organization.

WE CALL particular attention to the diagrams on pages 60, 61, and 62, showing the standard relations of hatchway, platform, and car sizes. These relative dimensions apply to all elevators — electric, hydraulic, steam, and belt driven.

ELECTRIC ELEVATORS

OUR long and varied experience in elevator manufacturing has enabled us to produce an Electric Elevator which in construction and operation stands absolutely in a class by itself. Since we introduced the Electric Elevator, its success has exceeded our most sanguine expectations. Our first Electric Elevator installation has been in successful operation for over fifteen years. We have in actual operation at this time more than 10,000 electric machines in this and in foreign countries.

The question of control of Electric Elevators has been for years a subject of study by our corps of experts, and the result has been the perfection of a number of controlling and safety devices, positive in operation, simple in construction, and practically automatic in the performance of their functions. The fact that we alone have given this question the amount of consideration which its importance deserves is one of the reasons that the name "Otis" is synonymous with high-class elevator engineering.

We have solved each problem connected with elevators on its own merits, and, therefore, for whatever service elevators are desired, we furnish them designed particularly for the conditions in question. We build electric engines with motors for any commercial voltage of direct current, and for two-phase and three-phase alternating current, each with a system of control most appropriate for that particular type.

OTIS CONTROLLERS

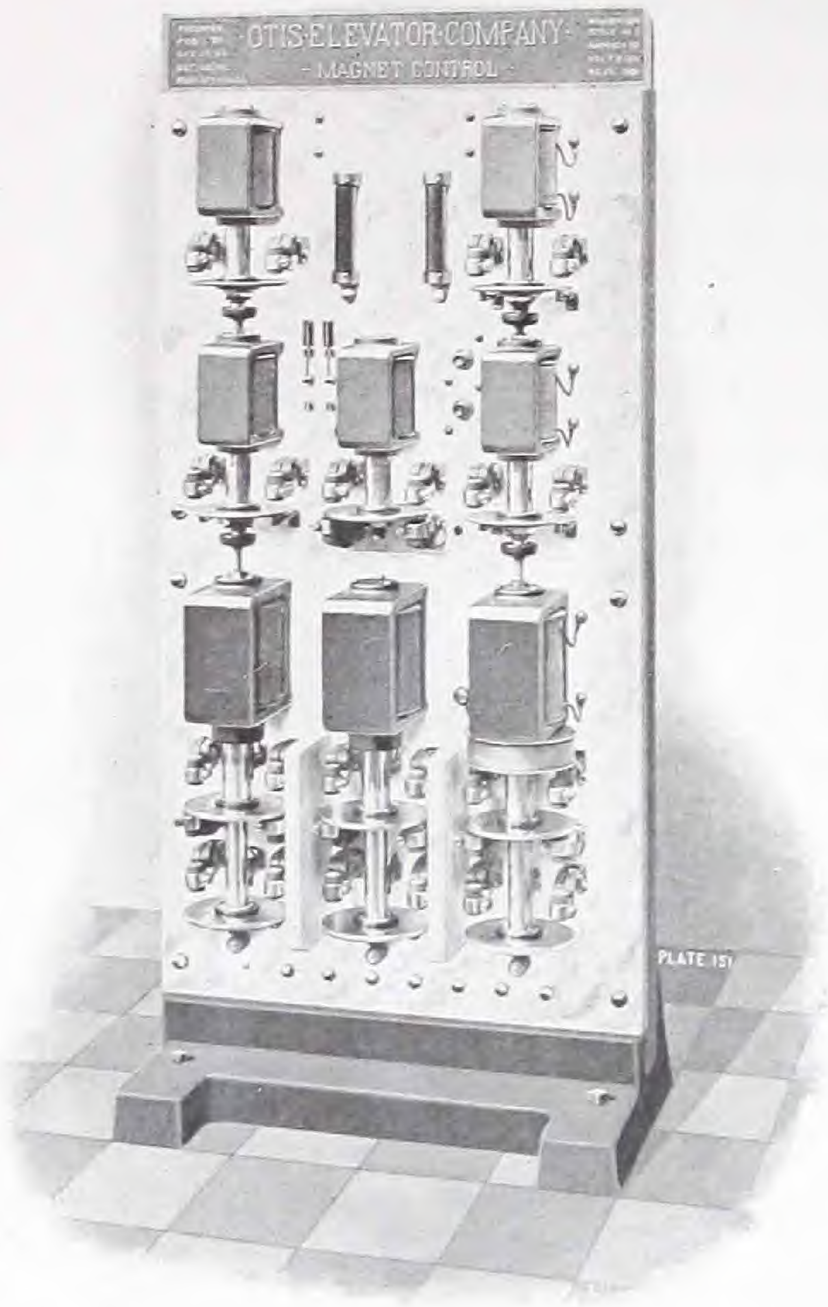


Fig. 1. Magnet Controller.

In Figure Two is shown the apparatus for mechanical control. The main line or reversing switch shown in the upper part of the illustration is operated mechanically and the smaller switches below, which cut out the starting resistance, are operated by magnets as in the larger controller shown in Figure One.

Figure One shows the apparatus used in connection with the electric system of control. The contacts are of liberal proportions and every part is built in the most substantial manner.

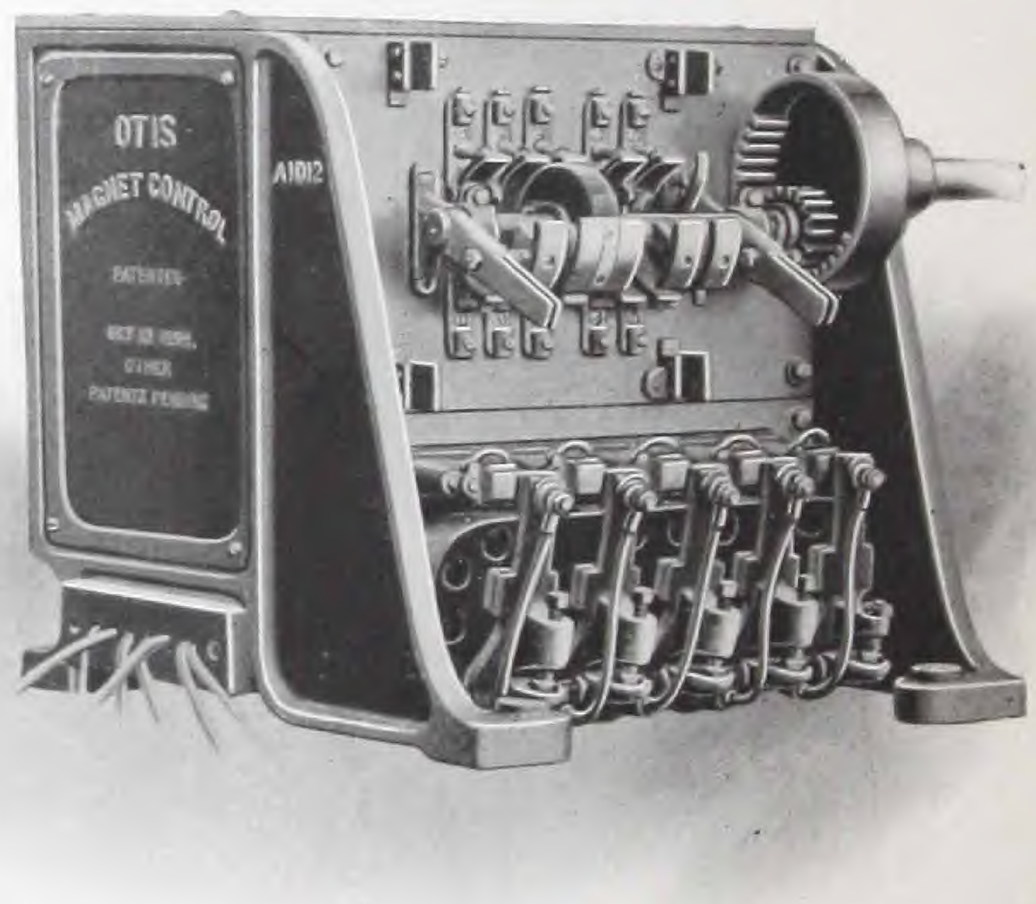


Fig. 2. Semi-Magnet Controller.

SYSTEMS OF CONTROL

THERE are two systems of control for electric elevators—the electrical and the mechanical. In the former, the elevator is controlled by a small switch within the car, operating pilot circuits which open and close the main line and reversing switches. On starting, there is considerable resistance within the armature circuit, and as the motor accelerates this resistance is automatically cut out step by step by electrically operated switches. By this means, the current is absolutely prevented from increasing above the amount for which the motor is designed and a gentle start, proportionate to load, is secured.

The mechanical system of control differs from that just described in that the line switch is opened, closed, and reversed through the medium of a lever or a hand-wheel within the car, by purely mechanical means. Closing the switch admits starting current only to the motor and thereafter the control proceeds in the manner already described in the respect that the starting resistance is cut out from the armature circuit by automatic switches step by step as the motor accelerates, the same protection of the motor against heavy currents being thereby afforded. Figure Two illustrates the reversing switch and the accelerating magnets mounted together and the same style of installation is shown in Figure Six. Figure Twelve shows the reversing switch located above the winding drum, with the accelerating magnets and starting resistance placed on top of the motor.

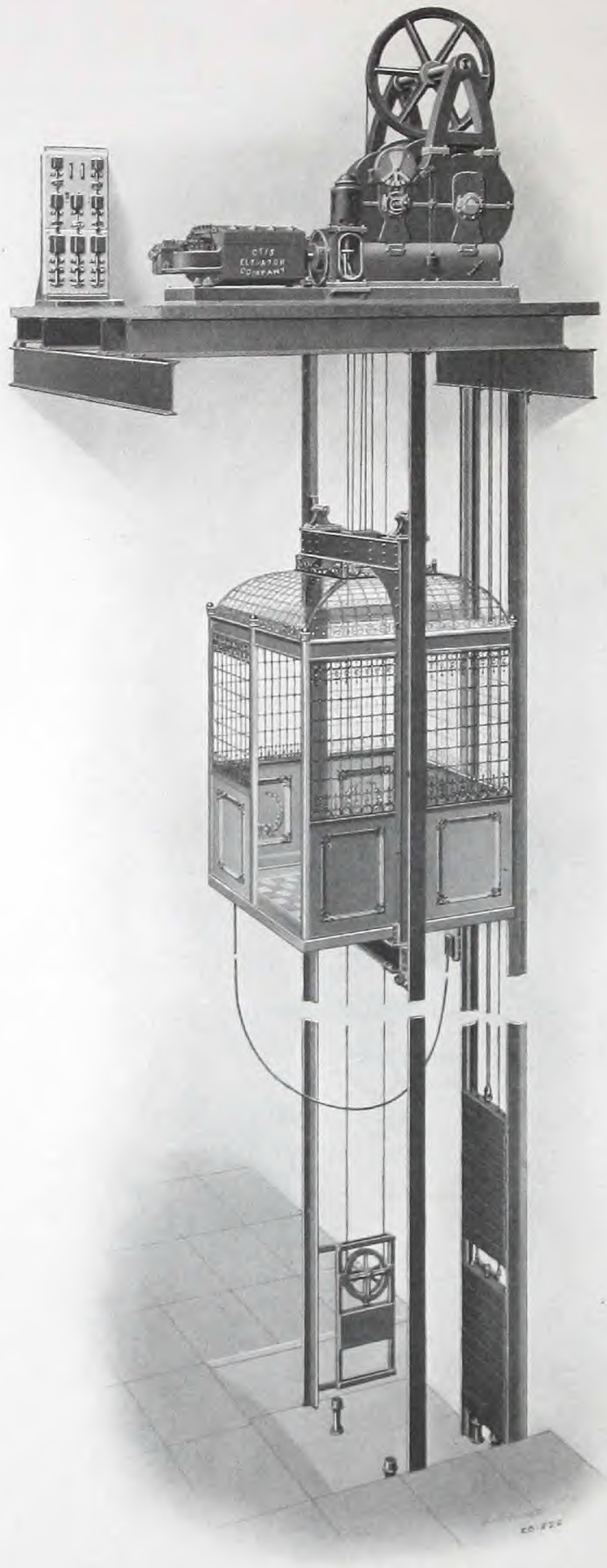


Fig. 3. Double Worm and Gear Electric Elevator, Overhead Installation.

OTIS ELECTRIC ELEVATOR

WITH DOUBLE WORM AND GEAR.

PASSENGER OR FREIGHT SERVICE. OVERHEAD INSTALLATION. ELECTRICAL CONTROL.

THE illustration shows the Otis standard drum type of the direct connected Elevator Engine placed immediately over the hatchway where ordinarily the overhead sheaves would be located. This method of installation has many desirable features, among which is the fact that basement space, which in many buildings is very valuable, is entirely free from elevator machinery.

The double-worm electric machine is recommended for high-speed passenger service, rather than the single-worm type shown on the next page. It is provided with electrical control only, the controlling apparatus being also located overhead adjacent to the engine. The double-worm machine is equally adapted, of course, for installation in the basement and is so located in thousands of buildings where basement space is of no particular value or where this method is, for other reasons, favored by the architects or engineers.

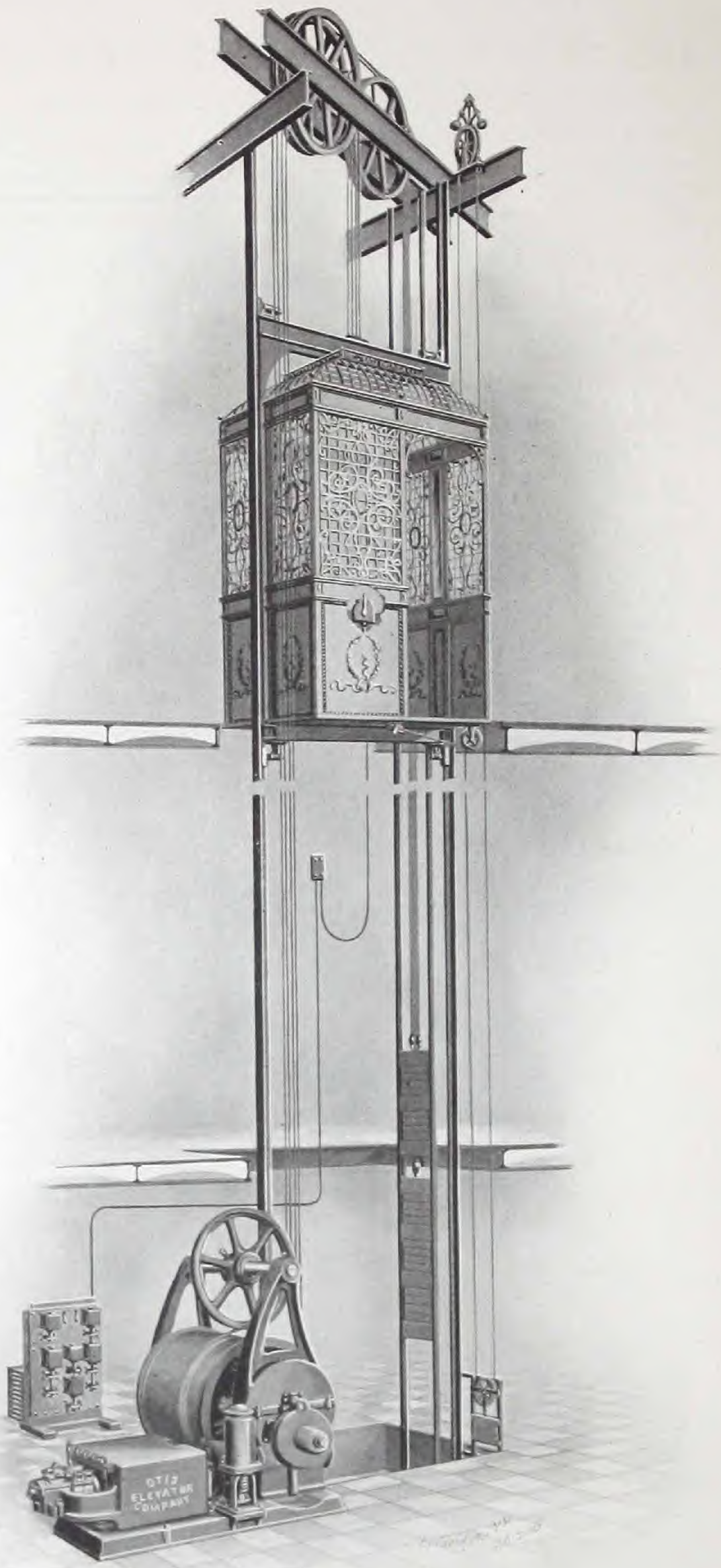


Fig. 4. Single Worm and Gear Electric Elevator, Basement Installation.

OTIS ELECTRIC ELEVATOR

WITH SINGLE WORM AND GEAR.

PASSENGER OR FREIGHT SERVICE. ELECTRICAL OR MECHANICAL CONTROL.
BASEMENT INSTALLATION.

FIGURE Four shows an Otis Electric Elevator Engine installed in the basement. The engine shown is the single-worm type which, although it is not built in as heavy capacities as the double-worm type, is the equal of the more powerful machine in smoothness of running, ease of control, and other desirable attributes.

This type of elevator may be operated mechanically by means of a hand wheel or lever within the car, or electrically by means of a small pilot switch as in the illustration. The single-worm engine may, of course, be located above the hatchway if the conditions make this style of installation desirable.

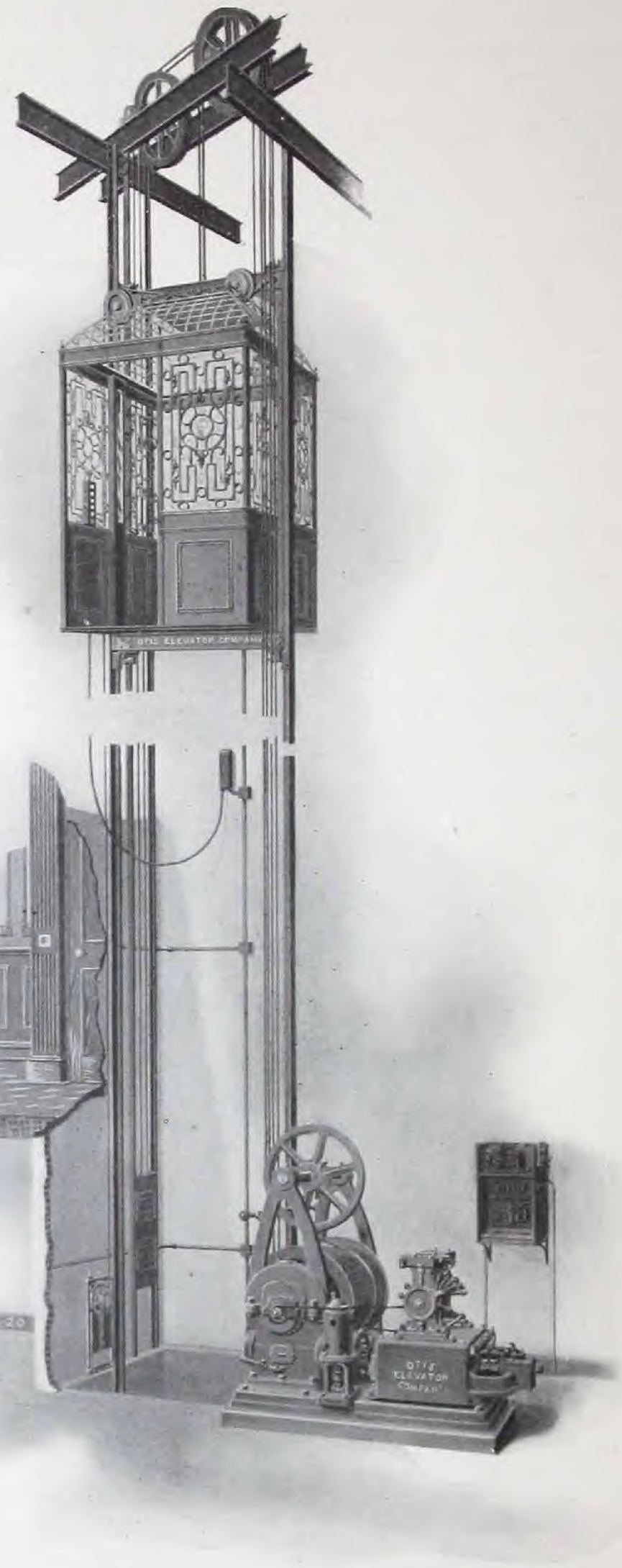
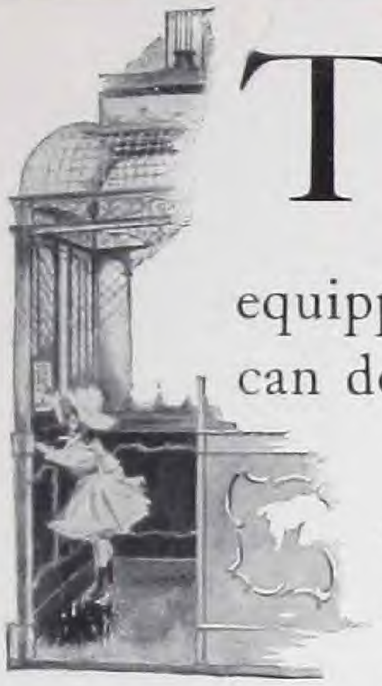


Fig. 5. Electric Elevator with Push-Button Control.

OTIS ELECTRIC ELEVATOR

WITH PUSH BUTTON CONTROL.



THIS type is designed particularly for private residences. No attendant is required, the elevator is always ready for service, and it is equipped with every safeguard which human ingenuity can devise against the possibility of accident.

A passenger desiring to use the elevator presses a button placed near the elevator shaft, and the car, if not in use, immediately travels to that floor and stops automatically. When the car has come to rest at that floor, the door can be opened. The passenger then enters the car and closes the door. The car will not leave that floor unless the door is tightly closed. Inside the car there is a series of push buttons, numbered to correspond with the various floors. The passenger pushes the proper button and the car proceeds to the desired landing and stops automatically. Not until the passenger has left the car and closed the door can the elevator be controlled from any other floor. Should the passenger desire, for any reason, to stop the car at any point of its travel, he can do so instantaneously by merely pushing the safety button with which the car is provided.

The extreme simplicity of the push-button method of control and the absolute provision against accident render the operation of this elevator easy and safe for any member of the household.

This type of elevator, although originally designed for private residences, has been installed with most satisfactory results in apartment houses, hospitals, and other places where the service is intermittent and it is desired to do away with the expense of an attendant.

THE OTIS ELECTRIC ELEVATOR ENGINE

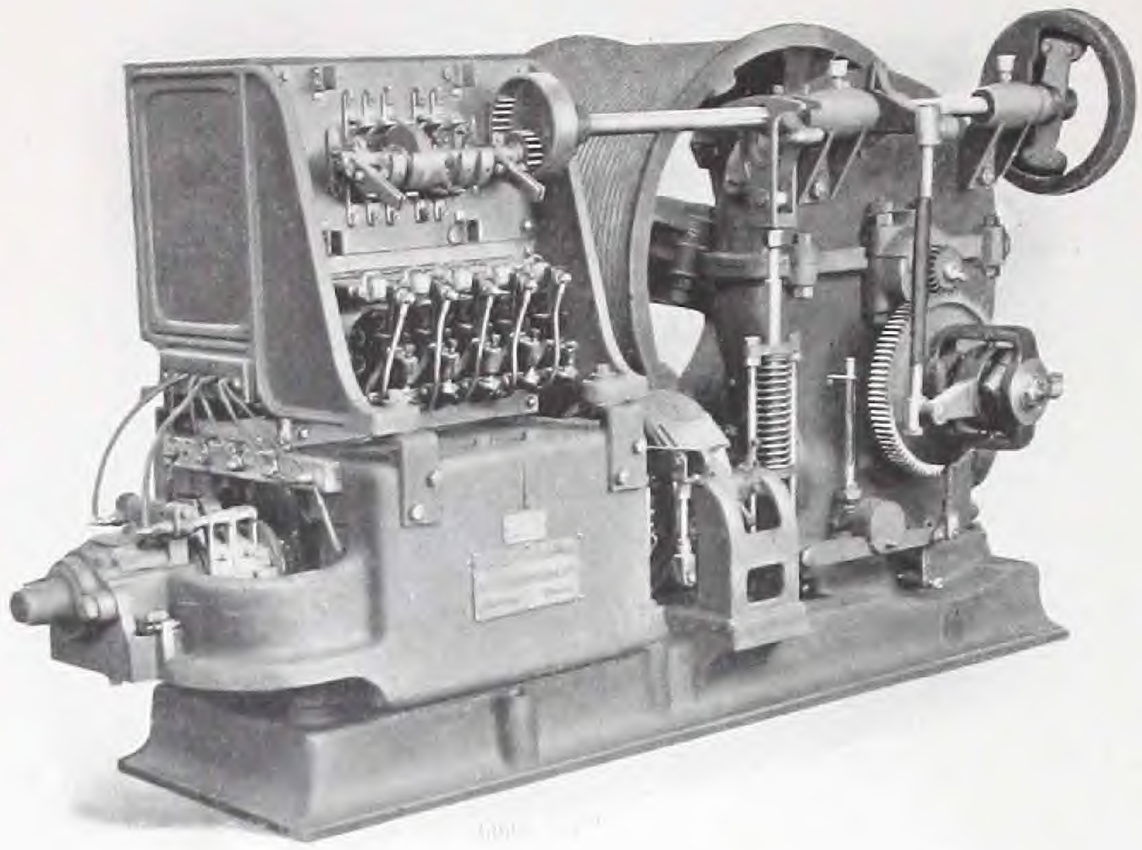


Fig. 6.

The Otis Electric Elevator Engine with single worm and gear. The controller box mounted upon the motor is that illustrated in Figure Two. The control rope passes over the small sheave on the right.

The Otis Electric Elevator Engine with double worm and gear, for high-grade passenger and freight service. This engine is furnished with the electric system of control only.

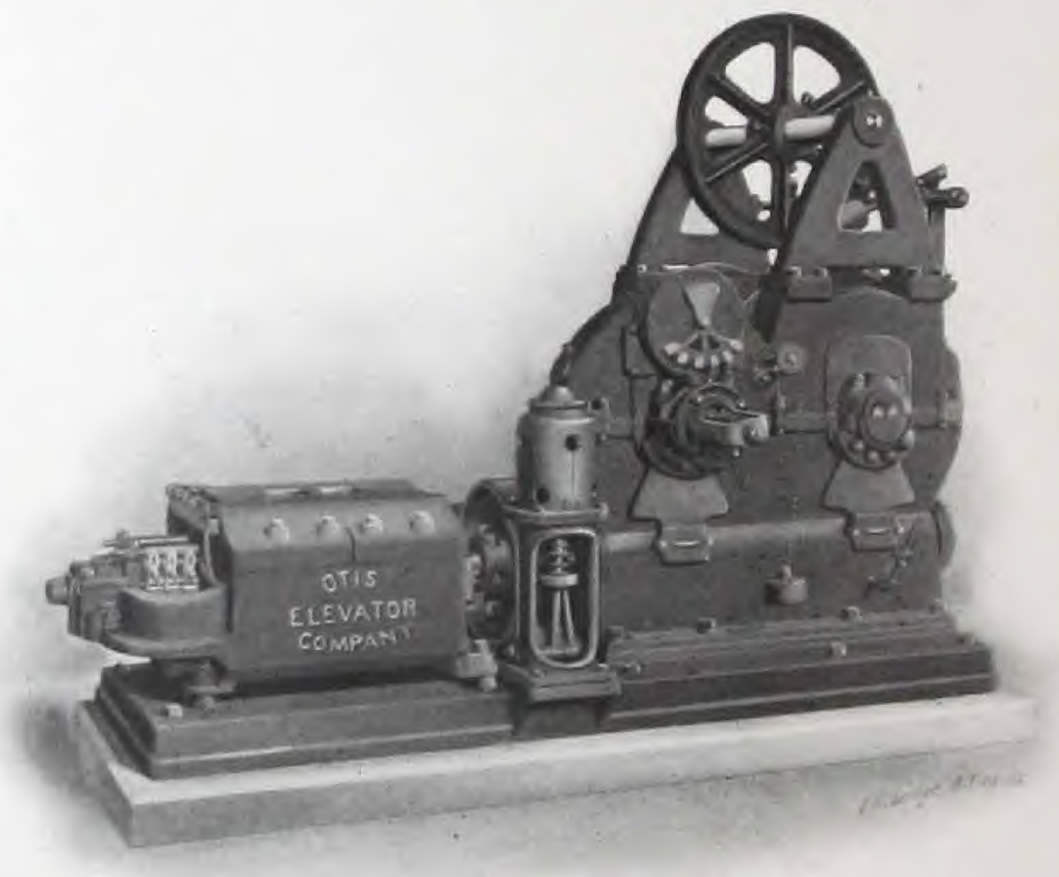


Fig. 7.

THE OTIS ELECTRIC ELEVATOR ENGINE

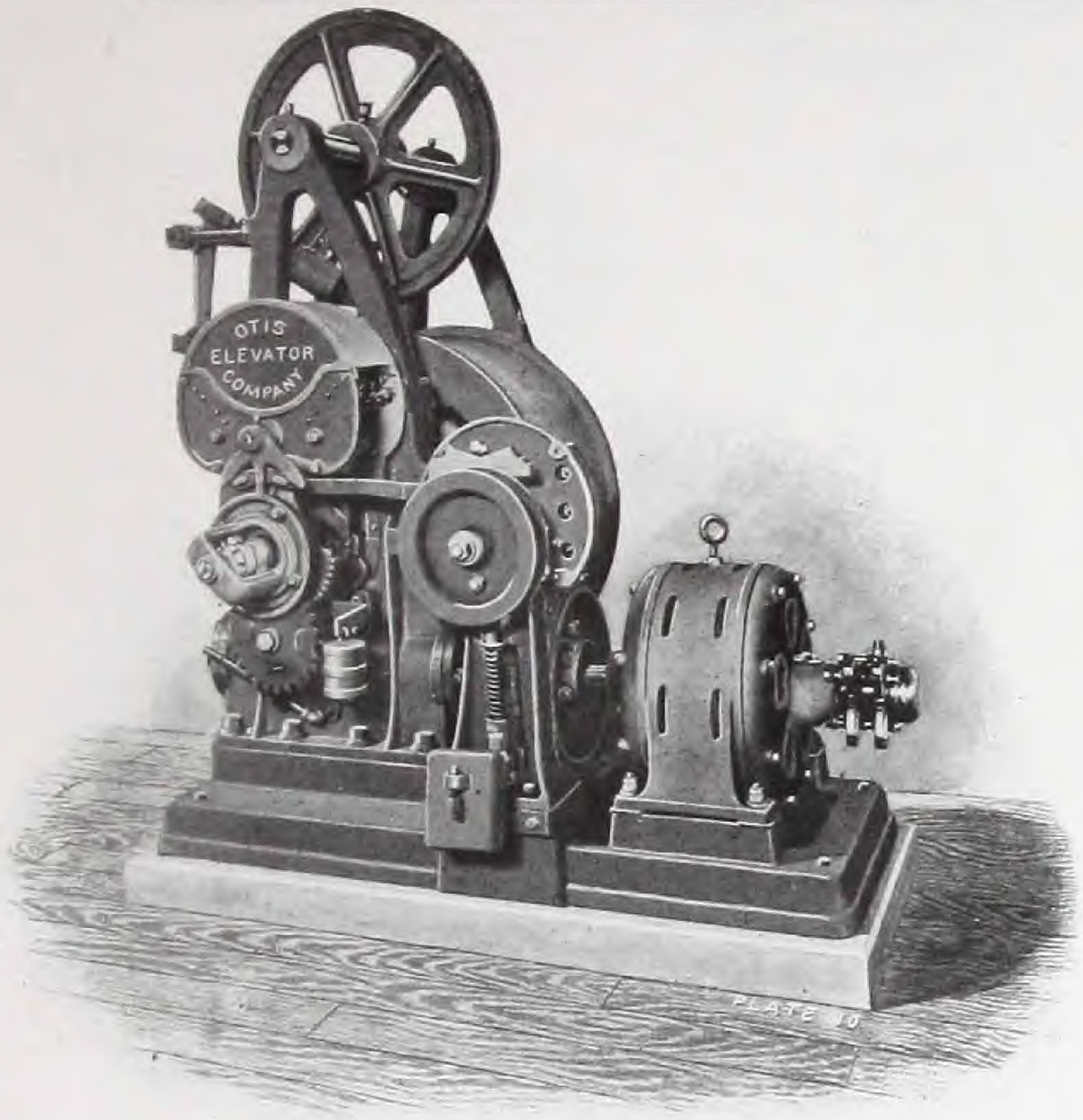


Fig. 8.

The Otis Electric Elevator Engine with alternating current motor, for either passenger or freight service. These engines are designed for operation on two-phase or three-phase circuits of any commercial voltage and frequency, and can be provided with either electrical or mechanical control. The engine shown is arranged for mechanical control.

The Otis Electric Elevator Engine used with the automatic residence elevator illustrated and described on pages 18 and 19.

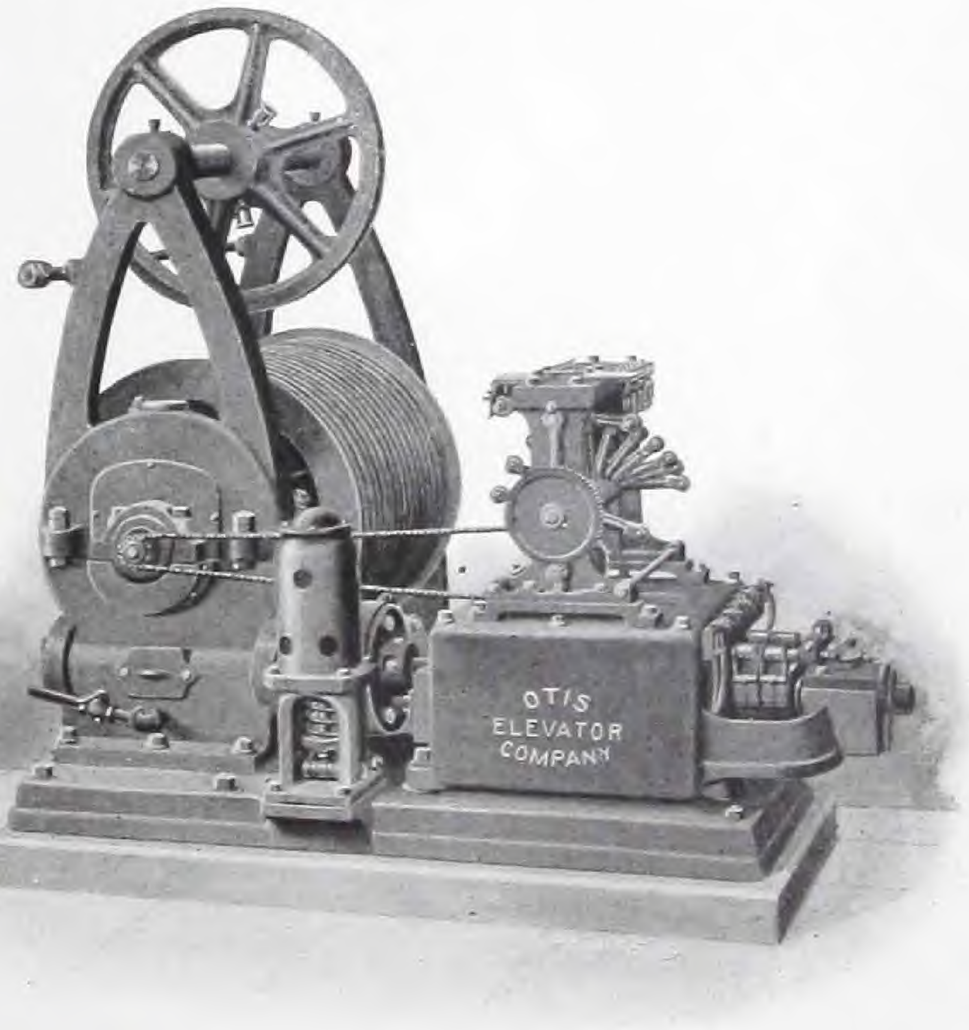


Fig. 9.

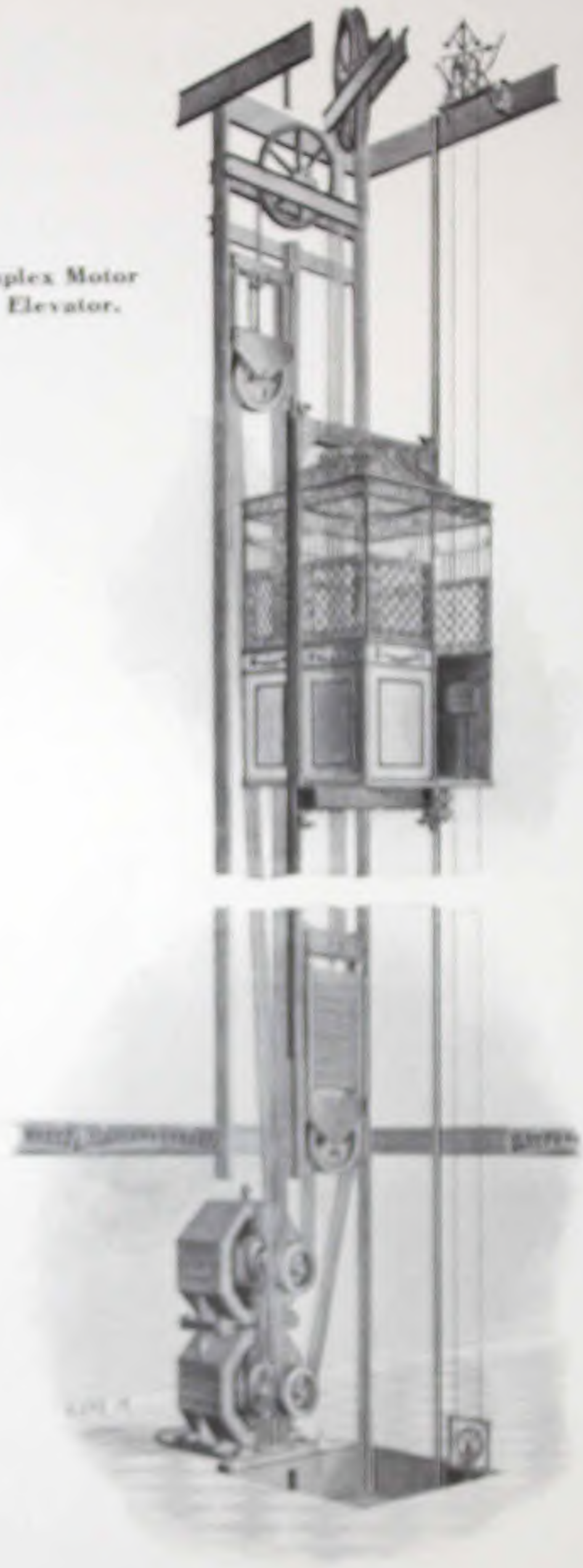
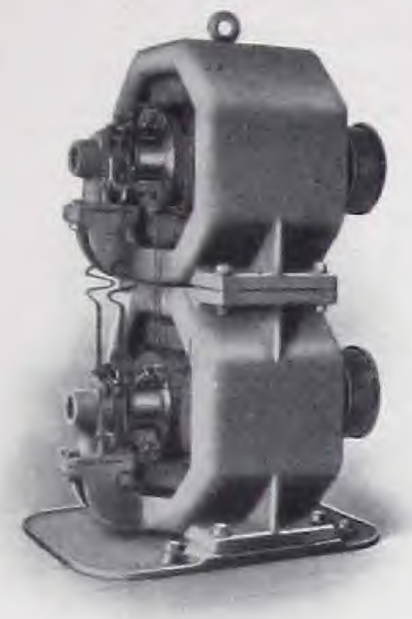


Fig. 10. Duplex Motor Electric Elevator.

DUPLEX MOTOR ELECTRIC ELEVATOR

FOR PASSENGER SERVICE.



IN this type of Electric Elevator the drum is dispensed with and a sheave is placed on the end of each armature shaft, and endless cables pass round these sheaves and are connected to the car and also to the counterweights.

The motors run in opposite directions, and as one or the other of the motors accelerates, the car moves up or down in the hatchway, its speed being proportional to the difference of speed of the two motors. When both motors are running at the same rate of speed the car is stationary, the same thing happening when the motors are stopped.

This type of electric elevator is particularly suitable for the service required by the modern high building, in which a long car travel and fast car speed are essential features.

ELECTRIC DUMB-WAITER ENGINE

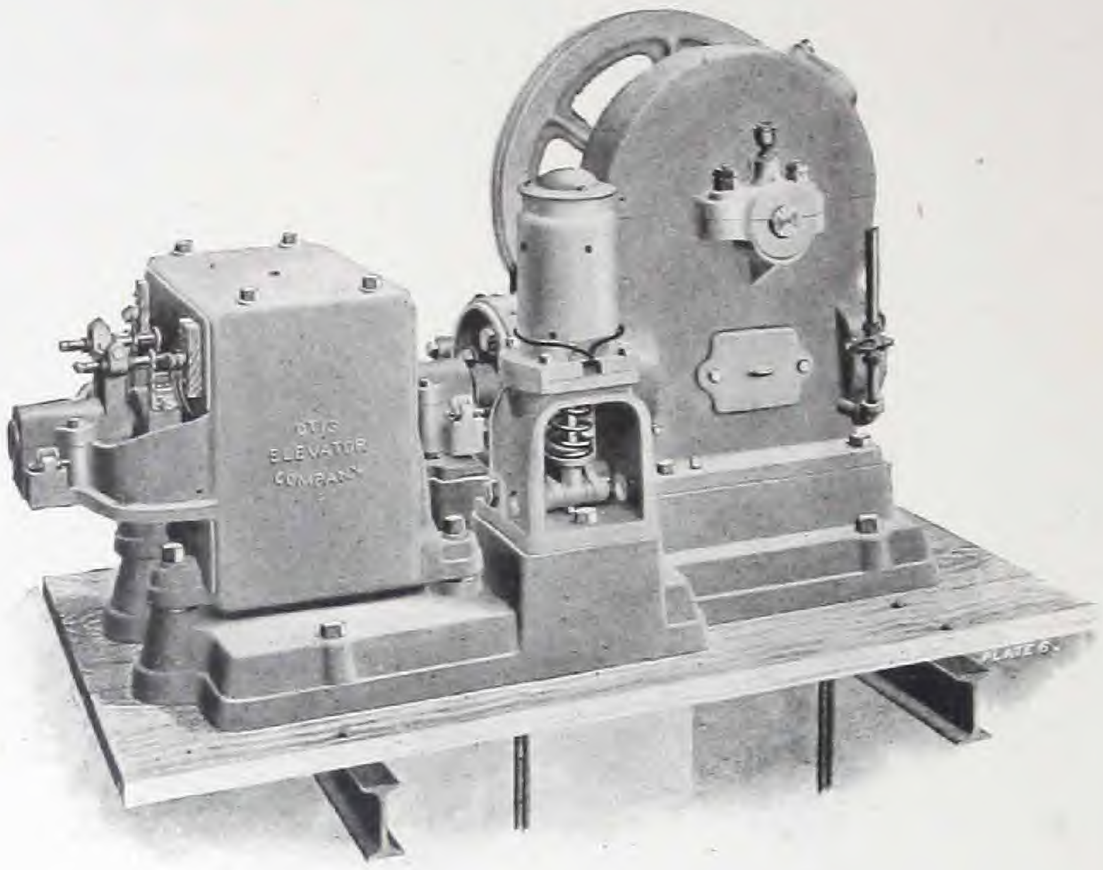


Fig. 11. Electric Dumb-Waiter Engine.

FIGURE Eleven shows the Otis Electric Engine for dumb-waiter service, built for placing over the hatchway. This type of elevator is an essential part of the equipment of high-class hotels and restaurants. We furnish them with either mechanical or push-button control, and build them for a variety of speeds and capacities.

INTERNAL-GEARED ELECTRIC FREIGHT ENGINE

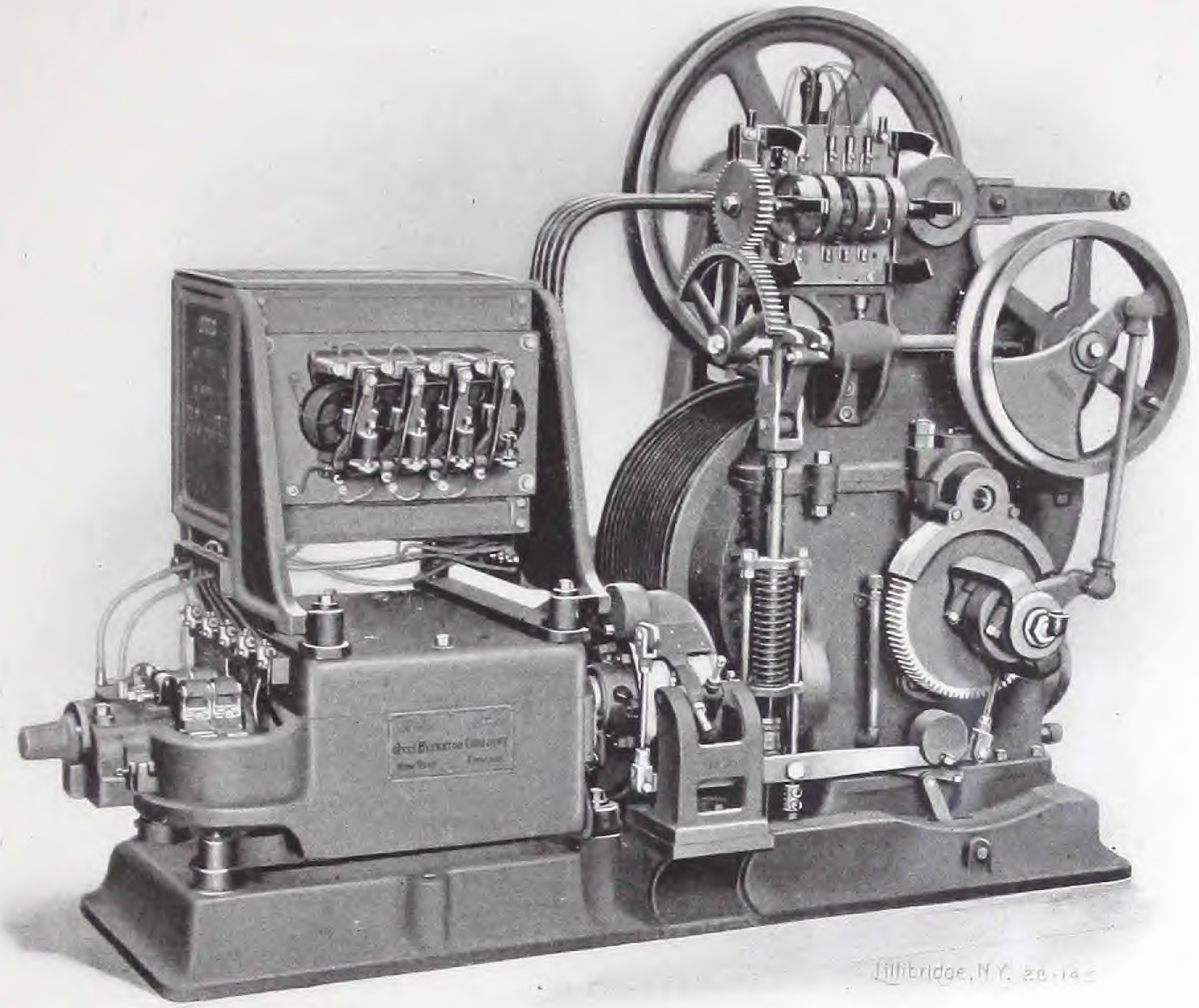


Fig. 12. Internal-Geared Electric Freight Engine.

FIGURE Twelve illustrates the Otis direct-connected, internal-geared Electric Elevator Engine for heavy freight service. All parts of the machinery are constructed with special regard to the capacities and speeds which may be required. The elevator can be furnished with either electric, lever, or hand-rope control. In the illustration, the engine is arranged for a hand-rope, in connection with the semi-magnet control — the style generally used on freight elevators of this type.

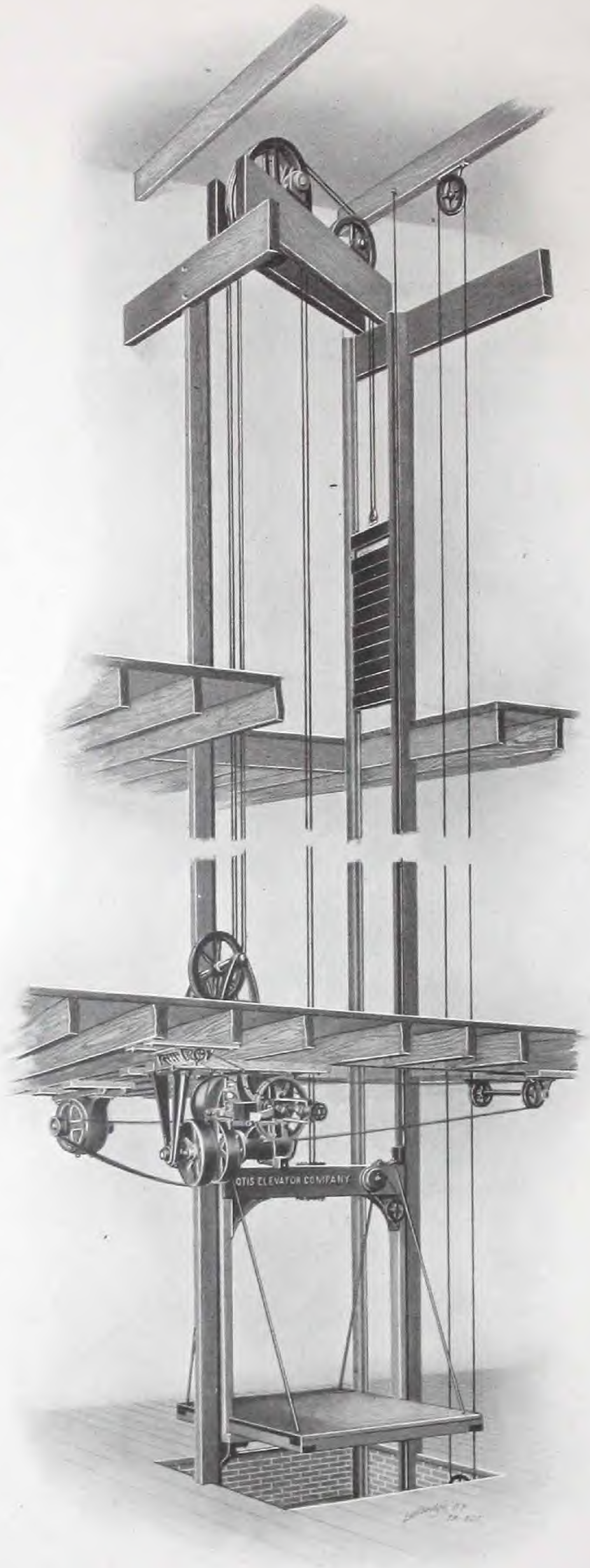


Fig. 13. Single-Belt Electric Freight Elevator.

SINGLE - BELT ELECTRIC FREIGHT ELEVATOR

THIS is a type of Electric Freight Elevator much used where moderate loads and a slow speed is all that is required, and as it is less in cost than a direct-connected elevator of equal capacity it frequently commends itself to purchasers on that account.

The winding machine and the electric motor can be placed either on the ceiling or the floor; but we show both attached to the ceiling, as this is the method of installation commonly adopted.

The motor is of round pattern with compound winding and of the reversible type. Both motor and controller were specially designed for this style of elevator, and in practice are proving entirely satisfactory.

COMBINATION PASSENGER AND FREIGHT ENGINE

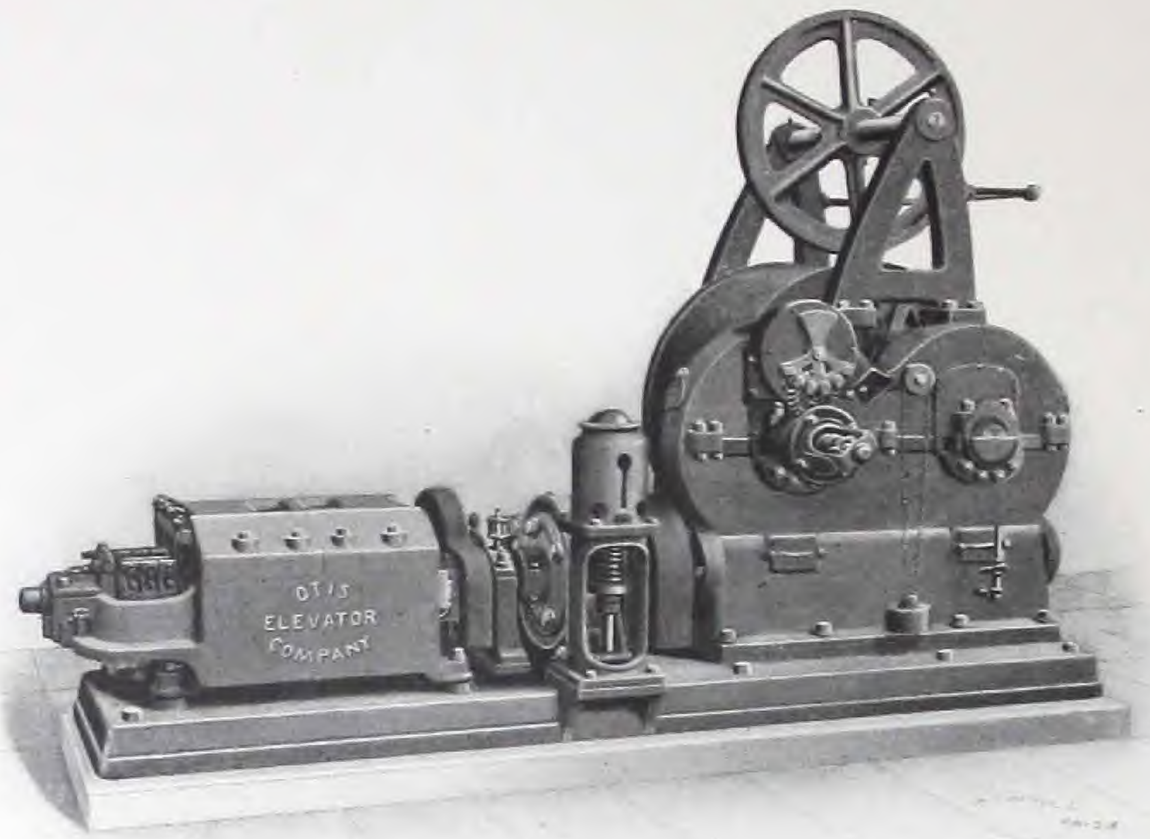


Fig. 14. Combination Passenger and Freight Electric Elevator Engine.

THIS engine, shown in Figure Fourteen, is designed to run ordinarily at the speed and with the load usual for passenger service. When it is desired to lift a load greater than its normal capacity, the back gears with which the engine is provided are thrown in and the lifting capacity is thus enormously increased, a proportionate reduction in speed taking place. The change of gearing can readily be made by anyone employed about the building.

A machine of this kind is generally included in office buildings and other structures where there is not sufficient freight traffic to justify the installation of a separate freight machine. Safes and other heavy articles can thus be moved without difficulty when the occasion arises.

ELECTRIC SIDEWALK HOIST

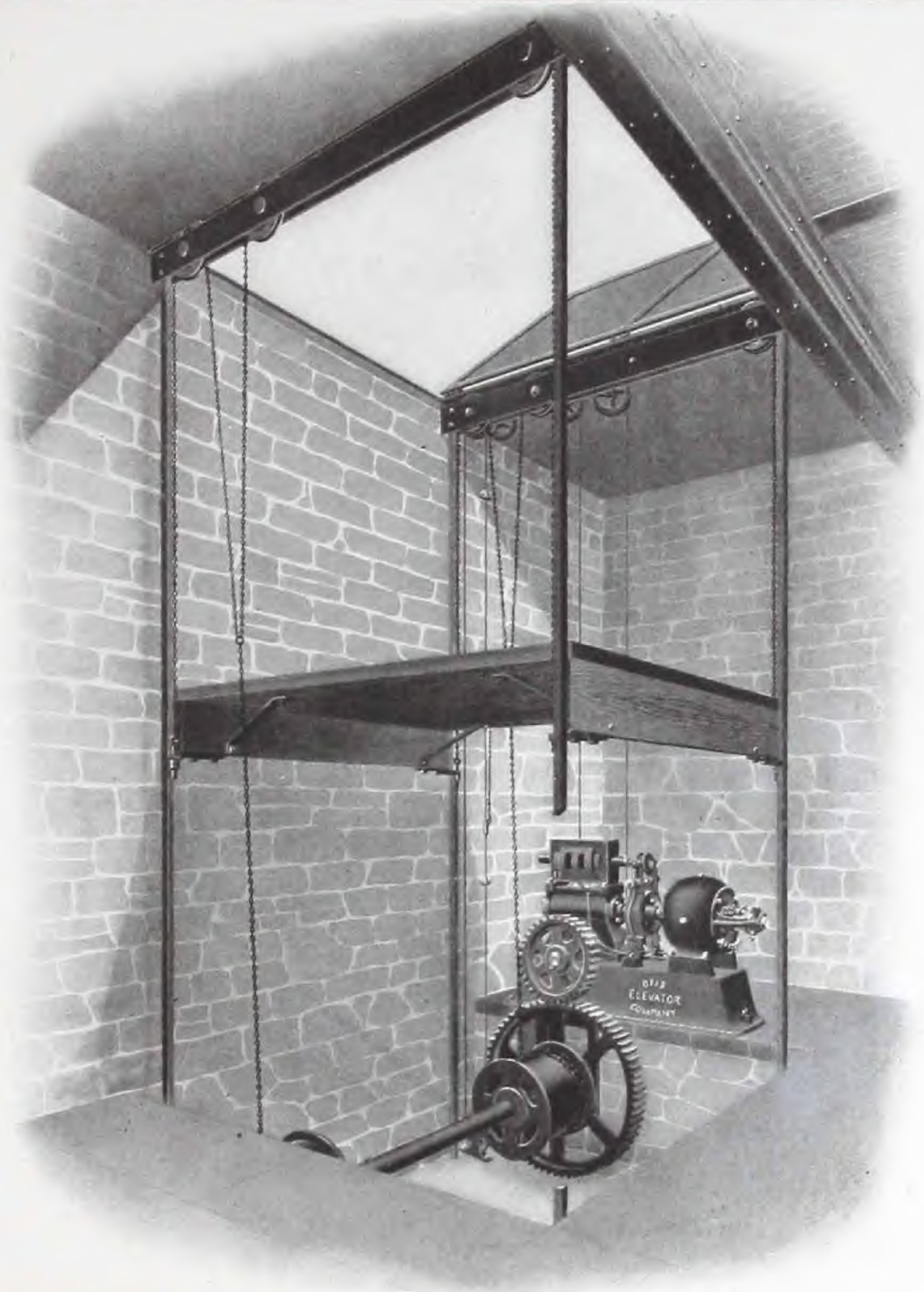


Fig. 15. Electric Sidewalk Hoist.

FIGURE Fifteen shows the Otis direct-connected Electric Sidewalk Hoist. As can be seen from the illustration, the machine is extremely compact and very simple in construction and the hoist can readily be installed in any basement. This machine is quite inexpensive, both in first cost and in the cost of operation, and the many situations in which its installation will be highly desirable readily suggest themselves.

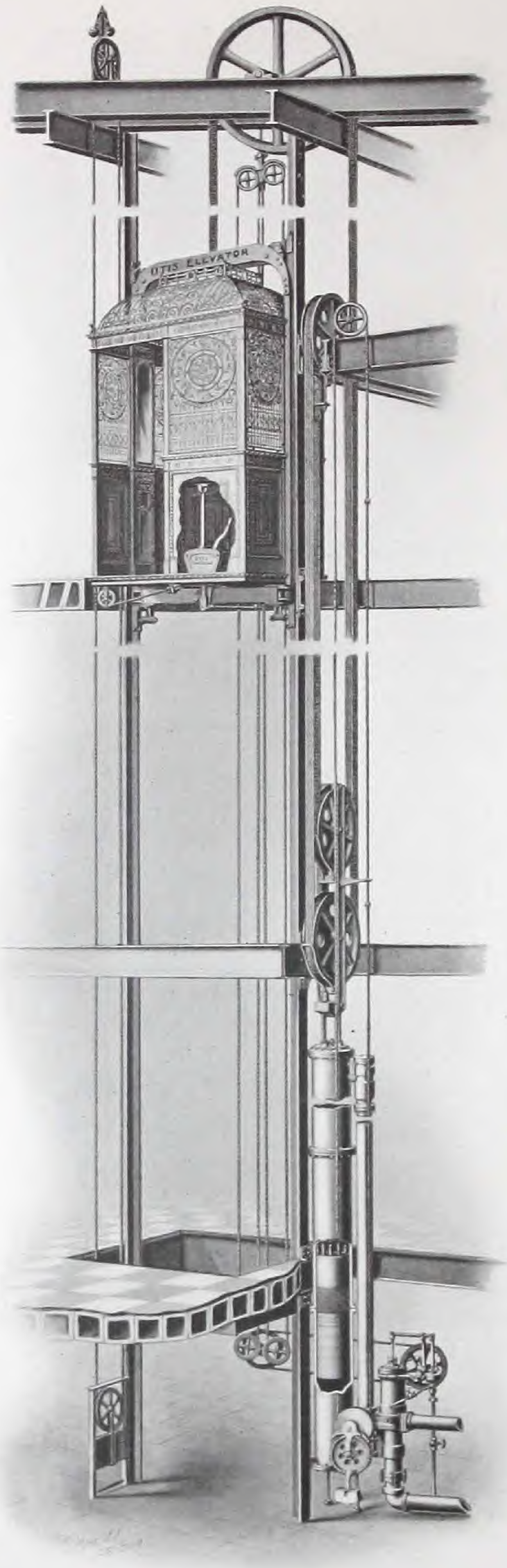


Fig. 16. Vertical Cylinder Hydraulic Elevator.

HYDRAULIC ELEVATOR

VERTICAL CYLINDER TYPE FOR PASSENGER OR FREIGHT SERVICE.

FIGURE Sixteen illustrates the type of Hydraulic Elevator which originally gave the name of "Otis" its world-wide reputation for the construction of safe and speedy elevators. These machines are installed in larger numbers than any other type of hydraulic machine. They are particularly suitable for the modern high office building where high speed and large capacity are essential.

The engine is provided with a simple device which limits to a predetermined speed the rate at which water can flow into and out of the cylinder, and therefore there is no possibility of the car moving at greater than the desired speed when it descends with a heavy load. The safety clutches, described and illustrated on pages 42 and 43, can thus be set to operate at a speed slightly above this rate and will come into action only in case of emergency.

The illustration shows the controlling lever in the car which operates the pilot valve connected to the main valve of the elevator engine. The machine here shown is geared 4 to 1; but where the building demands a higher travel of the car, we gear 6 to 1 or 8 to 1, as may be required. This type of elevator can be operated with any convenient water pressure and may be built to run at any speed up to 800 feet per minute.

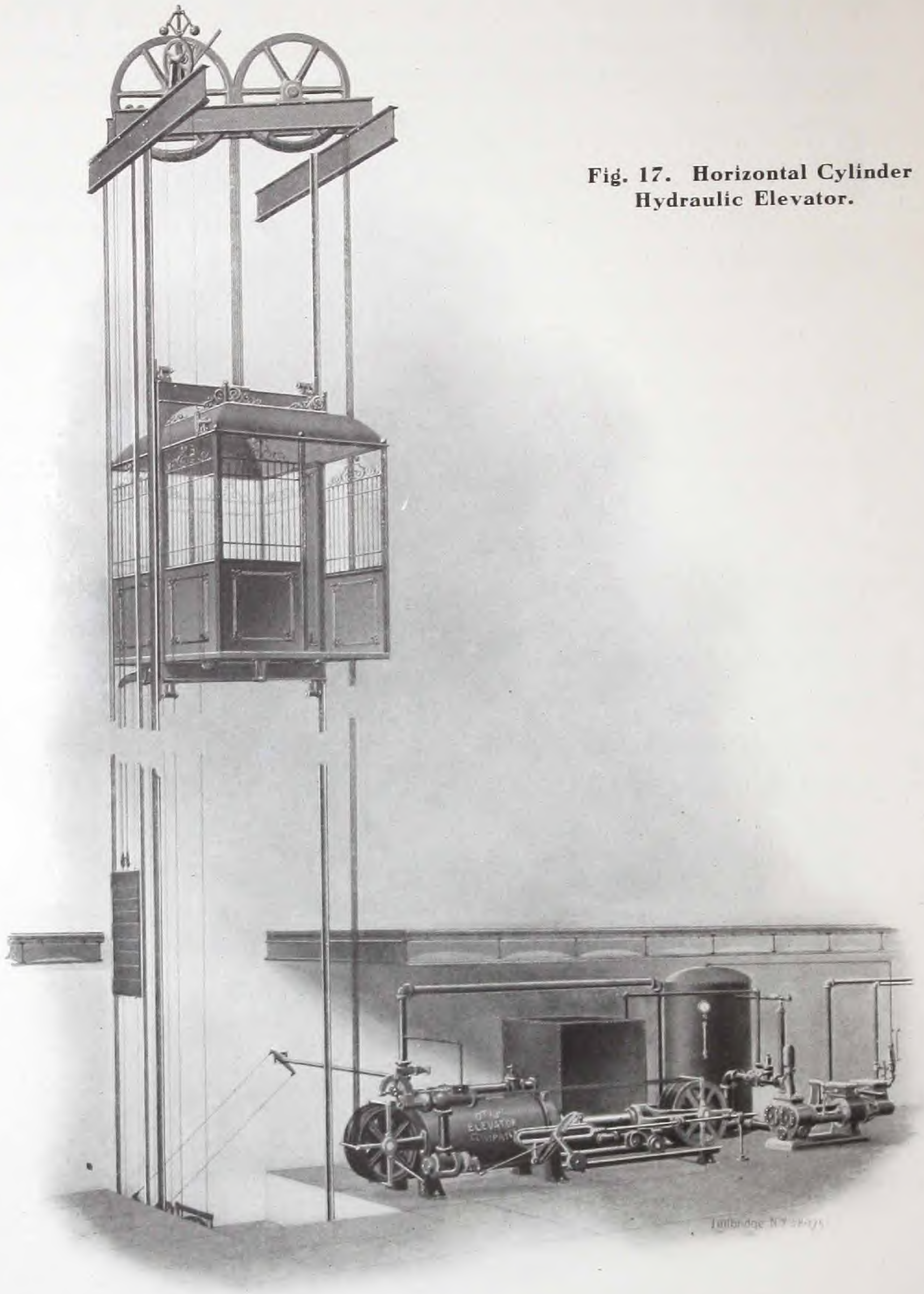


Fig. 17. Horizontal Cylinder Hydraulic Elevator.

HYDRAULIC PASSENGER ELEVATOR

HORIZONTAL CYLINDER TYPE FOR PASSENGER OR FREIGHT SERVICE.

FIGURE Seventeen shows the Otis Hydraulic Elevator with horizontal cylinder, designed for buildings where it is deemed advisable to install all of the elevator machinery in the basement.

In smoothness of operation, speed, safety, and other requisites of a high-class elevator it is equal to the vertical cylinder type, and the question of which is best adapted to the building in which the installation is to be made should determine the type of machine.

For buildings of a considerable height, we gear these elevators as high as 12 to 1. Where several are to be installed, the cylinders may be placed one above the other in a "double deck" or "triple deck" arrangement, thus further economizing floor space.

The illustration shows, in connection with the elevator, a compound-duplex elevator pump, compression and discharge tanks and the necessary piping connections. The tanks are here shown in the basement, but, in large plants especially, it is often found more convenient to place the compression tank in the attic.

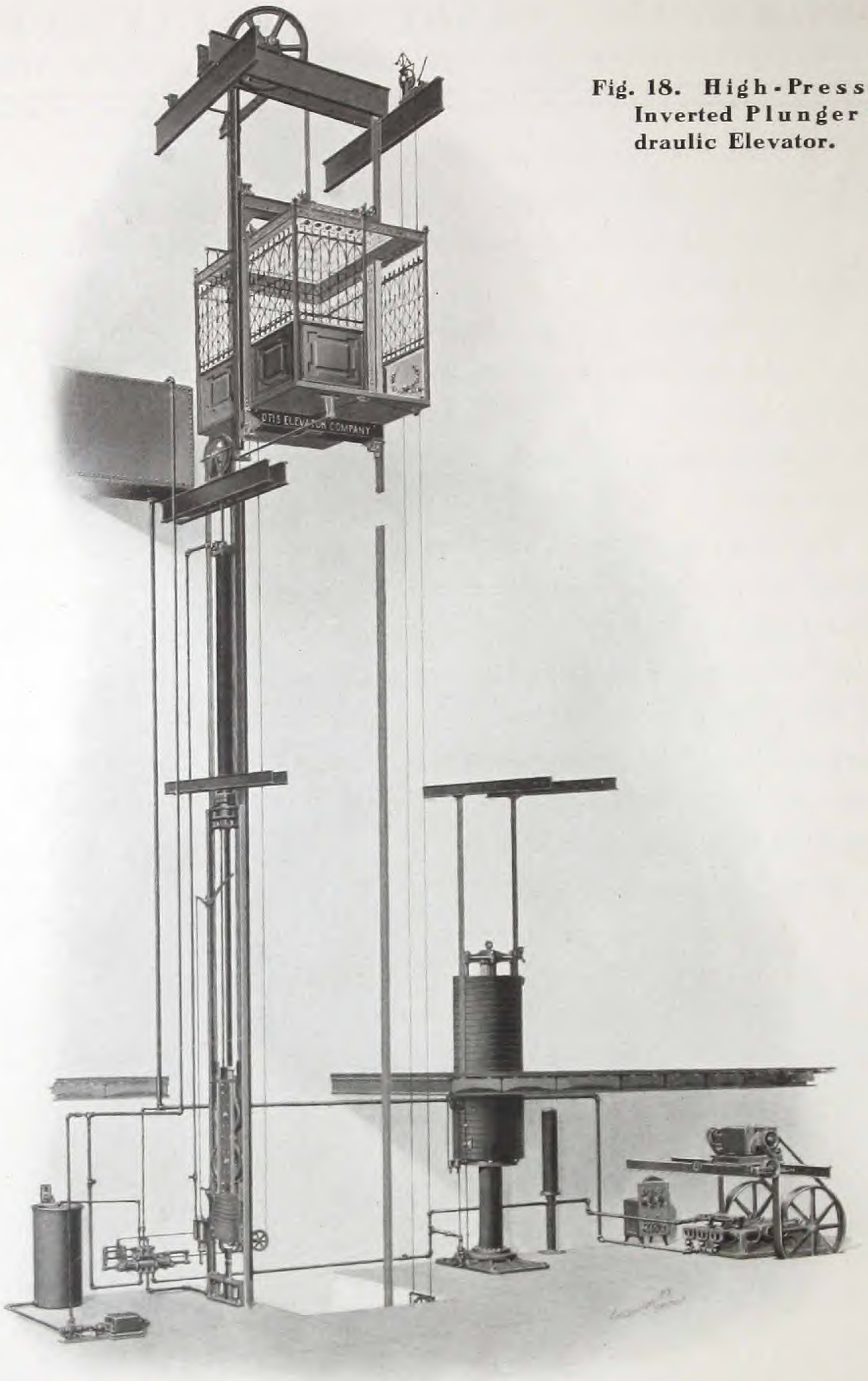


Fig. 18. High-Pressure Inverted Plunger Hydraulic Elevator.

HIGH-PRESSURE HYDRAULIC ELEVATOR

INVERTED PLUNGER TYPE FOR PASSENGER OR FREIGHT SERVICE.

WITH this type of elevator, the greatest economy in space in the disposition of the elevator machinery is possible. The plunger and casing, being of small diameter, can be suspended in the hatchway between the cars. This type of elevator is operated at a pressure of from 600 to 800 pounds per square inch. To maintain the pressure, an accumulator of the weighted type, such as that shown in the illustration, is used, but one accumulator being necessary for each plant. This elevator is adapted for either passenger or freight service.

In connection with this type of elevator is shown a triplex motor-driven pump. By means of an ingenious electrical device, the speed of the motor is governed by the position of the accumulator. As the accumulator descends, due to the withdrawal of water for the elevator service, the speed of the motor is increased, step by step, by means of automatic switches, thus regulating the output of the pump in proportion as water is required by the elevator.

We have many of these elevators in operation and under test, and in regular service they show the highest possible efficiency and economy. This type of elevator was decided upon for a number of the largest elevator plants which we have installed.

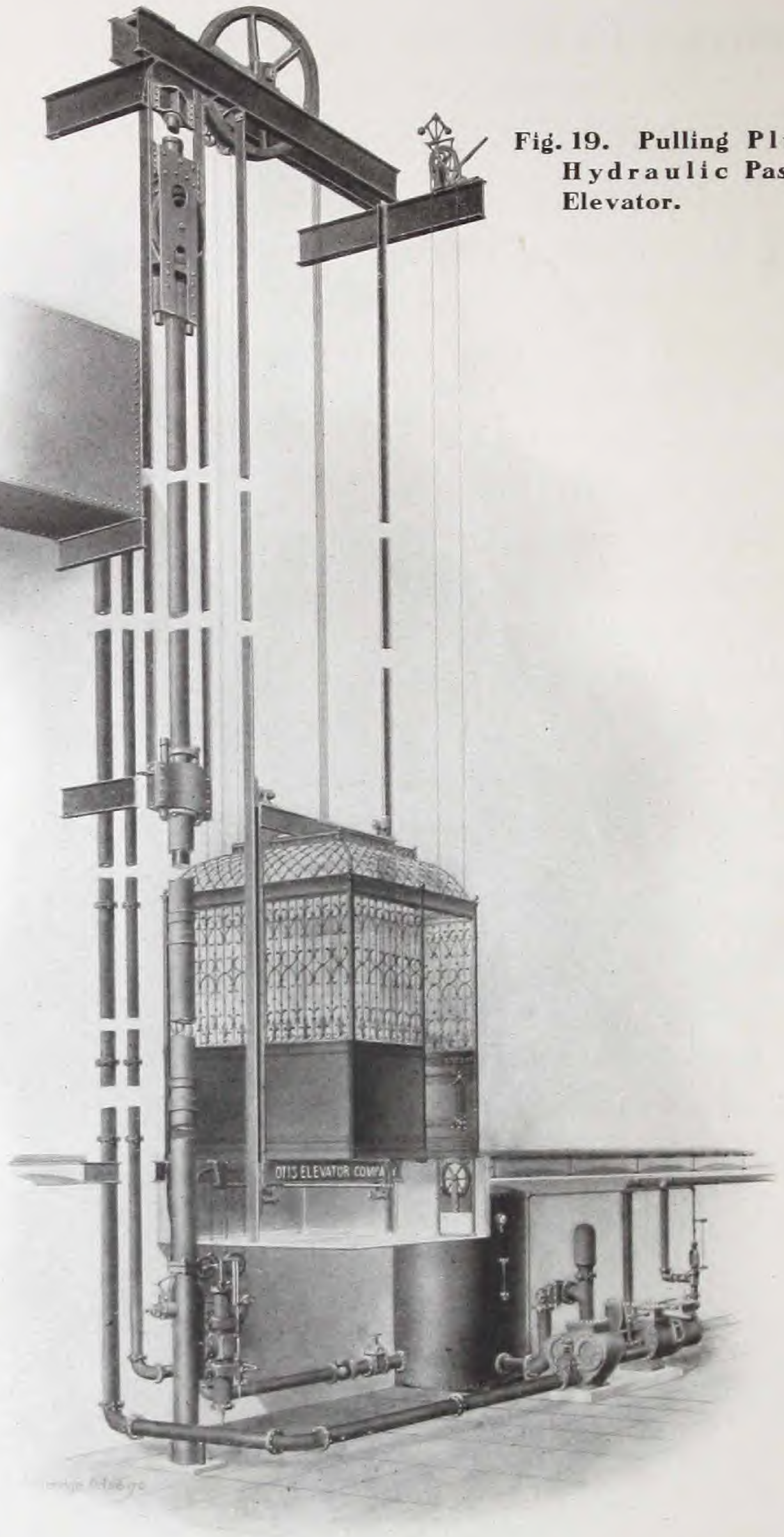


Fig. 19. Pulling Plunger Hydraulic Passenger Elevator.

HYDRAULIC PASSENGER ELEVATOR

PULLING PLUNGER TYPE FOR PASSENGER SERVICE.

THIS cut illustrates the Otis Pulling Plunger Type of Hydraulic Elevator, which differs from any other in the respect that when lifting the load it does not consume water but discharges it from the cylinder.

In this elevator the weight of the plunger itself, which is of solid steel, lifts the load, the plunger descending into the cylinder as the car rises in the hatchway. When the operation is reversed and the car descends, the water is pumped up to the required pressure and, assisted by the weight of the car, raises the plunger and the car descends.

This elevator was designed to meet the requirements of high buildings, and on account of its economy in operation, very high speed, and the extreme rapidity with which stops and starts can be made, ranks high among hydraulic elevators.

As this machine is operated under a medium pressure, rarely exceeding 250 pounds per square inch, it is possible to use the compression-tank system. The illustration shows a compound duplex pump with compression and discharge tanks, together with the necessary piping connections.

The compression tank is usually placed in the basement and the discharge tank either on the roof or in any convenient location at least as high as the top of the cylinder, so that the cylinder is always filled with water, thereby acting as a safety brake.

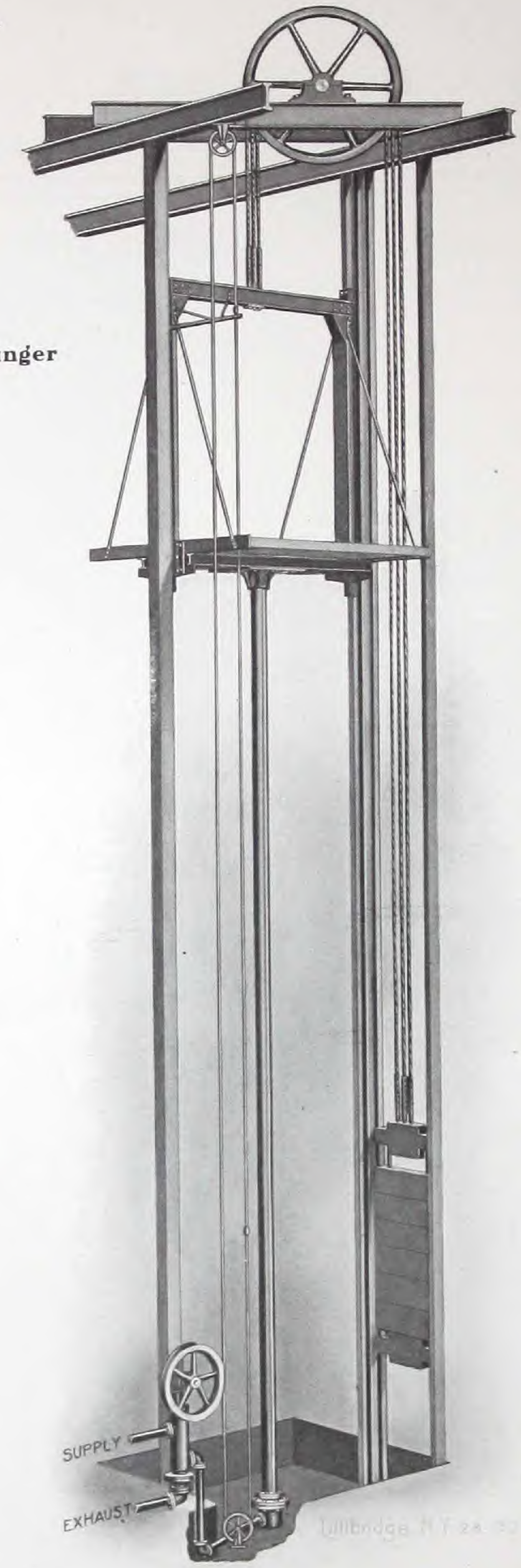
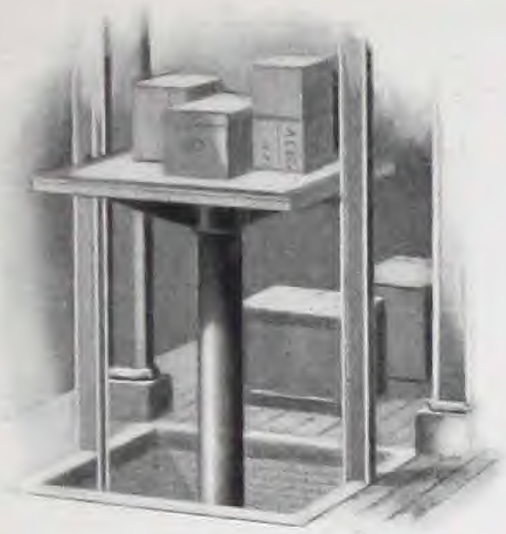


Fig. 20. Plunger Elevator.

PLUNGER ELEVATOR

FOR PASSENGER OR FREIGHT SERVICE.



THE Plunger Elevator is conformable for either passenger or freight service and has a high degree of efficiency, due to the fact that the power is exerted direct without the intervention of sheaves or cables. The car is always supported from beneath by the plunger, and therefore there is no necessity for providing it with the safety appliances used on the car in other types of elevators. Owing to the fact that a cylinder of a length equal to the car travel must be sunk in the ground, the nature of the soil has a considerable bearing upon the cost of the installation.

For passenger service, we have built plunger elevators with travels as high as 225 feet and with speeds as great as 600 feet per minute. For freight service, we have built them with a lifting capacity up to 80,000 pounds, and we regard this type as particularly suitable to these very heavy loads.

In the vignette is shown the plunger elevator arranged as a sidewalk hoist, a service for which it is very well adapted, as the very simple elevator machinery can be placed underneath the platform. If required, the elevator can be so constructed as to raise the platform any height above the sidewalk, for convenience in loading or unloading trucks.

DIRECT STEAM PASSENGER ELEVATOR.

FIGURE Twenty-one illustrates the Otis high-speed Worm-Geared Passenger Elevator Engine, and is the result of much experiment to perfect a steam engine which would combine speed, smoothness of running, and ease of control, which are essentials in any elevator for passenger service.

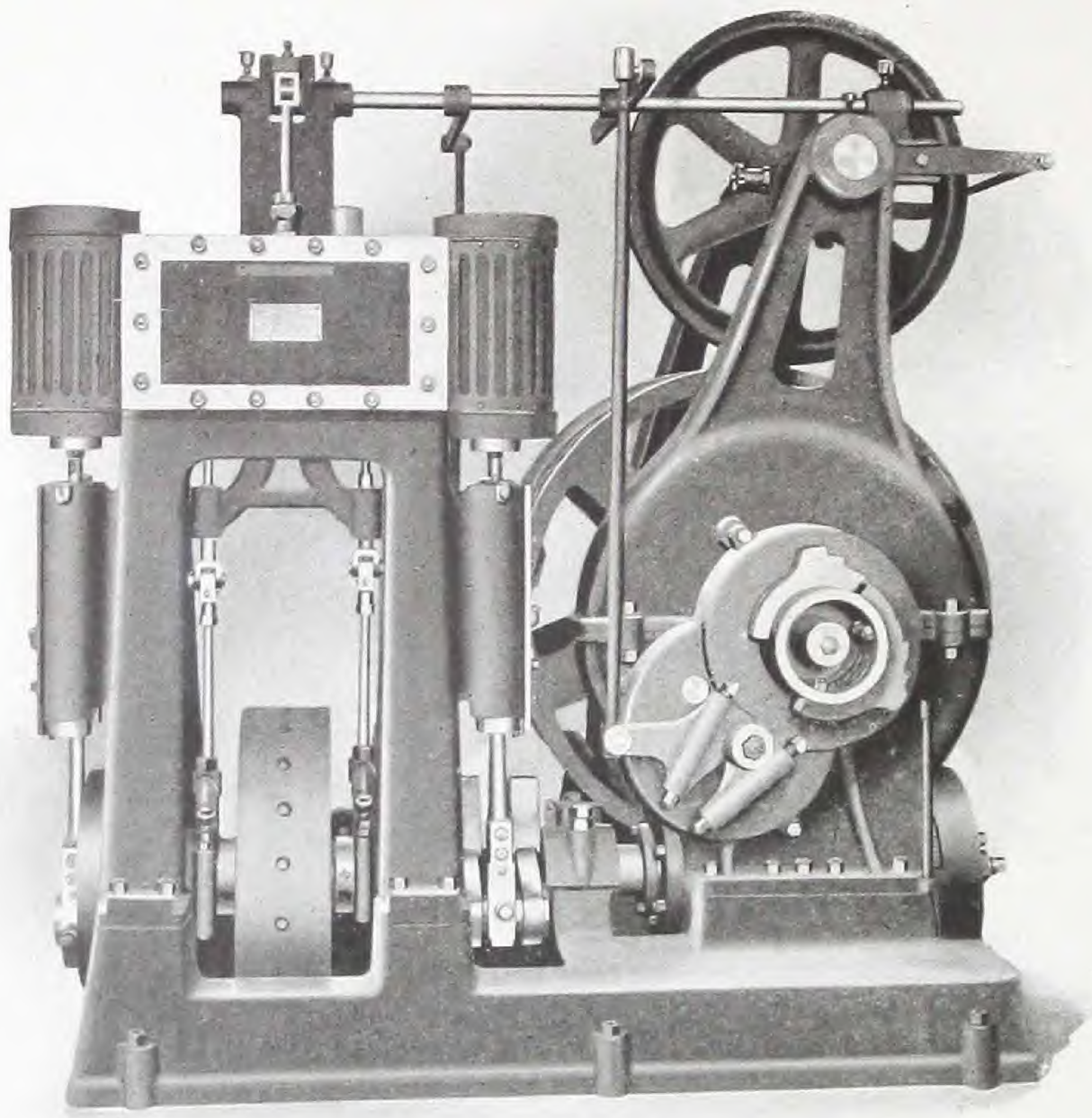


Figure 21. Worm-Geared Steam Passenger Elevator Engine.

For economical reasons this type of elevator has been largely superseded by the electric, but for certain locations and where electric current cannot be obtained, it holds its place as the highest type of the steam passenger elevator.

Our engine, if required, is capable of developing a car speed of 400 feet per minute, which no other elevator builders have been able or willing to guarantee with this style of elevator.

STEAM BELT FREIGHT ELEVATOR

THE engine shown in Figure Twenty-two was at one time considered the best for freight purposes. During the last few years it has given way to the modern high-pressure hydraulic and electric elevators, but it is still recognized as the standard machine of its class.

Hundreds of these elevators have been in continuous operation for over twenty years in prominent mercantile buildings in New York, Chicago, and other cities, and are giving satisfactory service today. The general construction of the engine remains substantially as first designed, but devices have been added to still further increase its safety and facilitate its control.

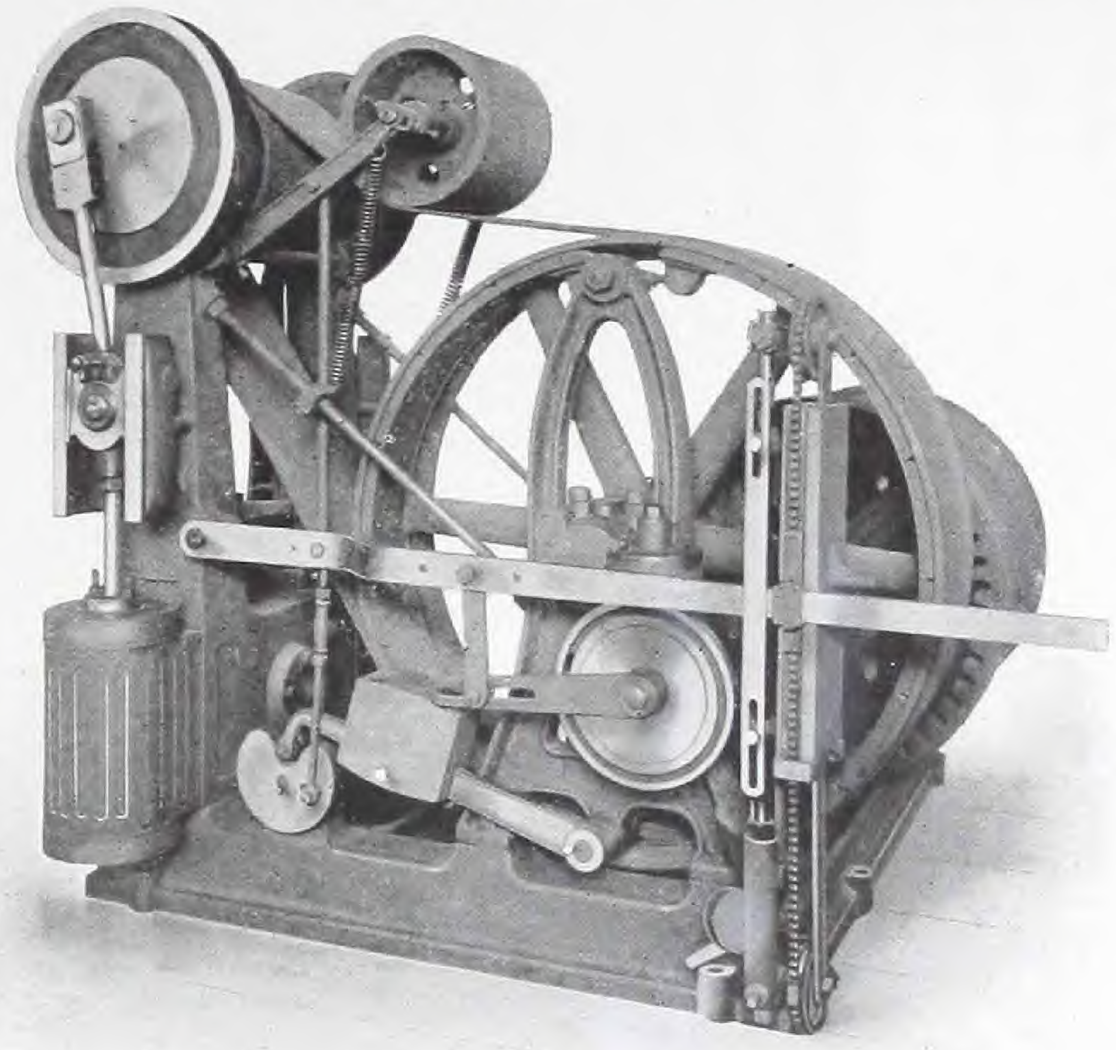


Fig. 22. Belt and Geared Steam Freight Elevator Engine.

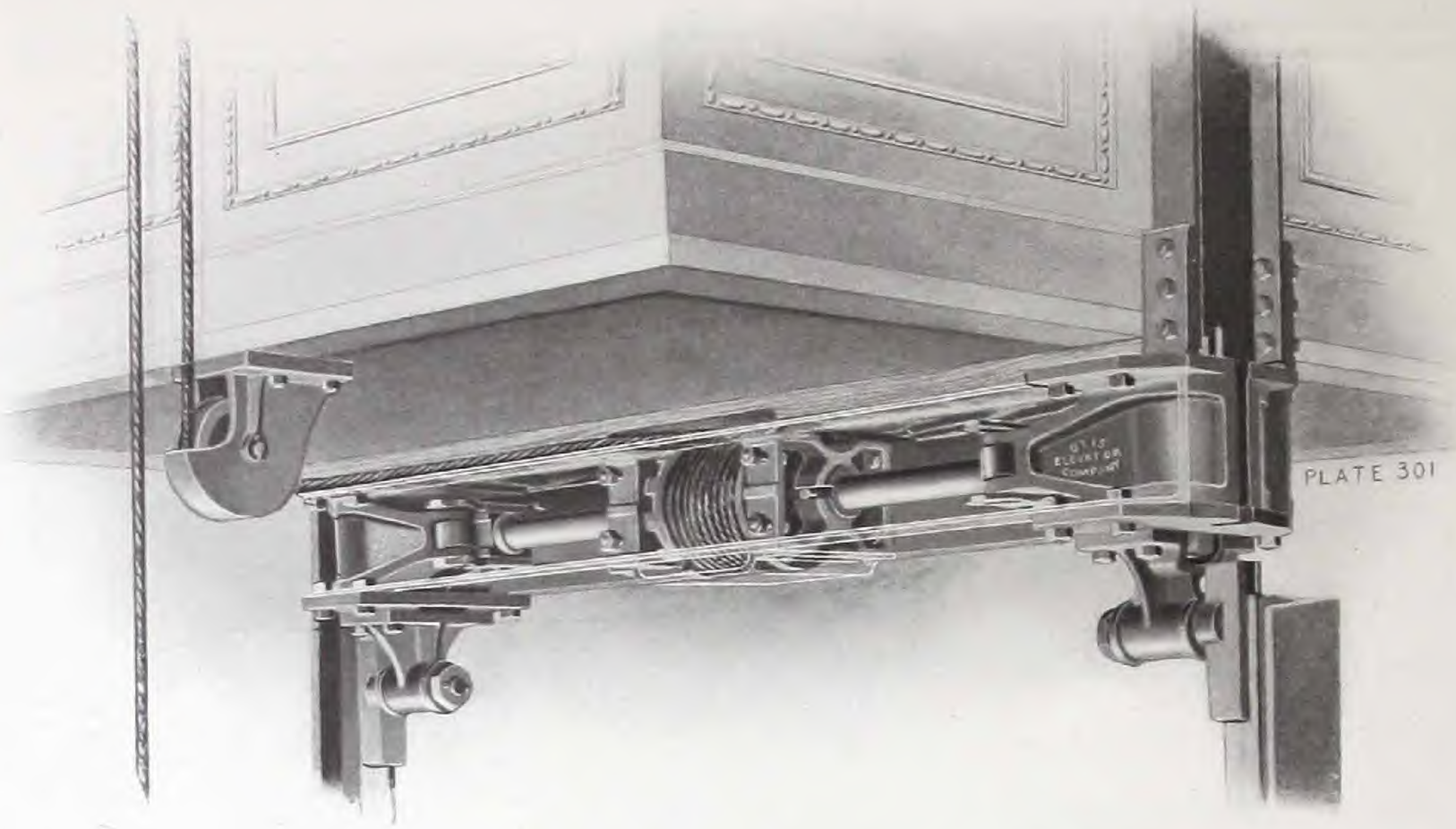


Fig. 23. Safety Clutch for Steel Guide Posts.

Fig. 24. Safety Clutch for Wooden Guide Posts.

SAFETY DEVICE

WHILE the factor of safety in the construction of Otis Elevators is materially in excess of any strain to which they may be liable in their operation, each elevator is provided with special safeguards against all known forms of elevator accidents. The safety stopping device does not differ materially in principle from that which proved its worth thirty years ago, such changes as have been made being principally to adapt it to the heavier loads and higher speeds which now prevail.

The governor, such as shown in the vignette on this page, is located at the top of the elevator hatchway and is suitably connected to the car, entirely independent of the lifting cables. Should the elevator car, for any reason, exceed the predetermined speed for which the governor has been set, the powerful clutches located beneath the car grip the guide posts, bringing the car to a safe and easy stop. The form of grip shown in Figure Twenty-three is used with steel guide posts, and the form shown in Figure Twenty-four is used with wooden guide posts.

From the time of the formation of the company, our experts have made the question of safety a special study, and every feature which tends to ensure immunity from accident has been embodied in the Otis product.

S T E A M H O I S T

FOR USE ABOARD SHIP.

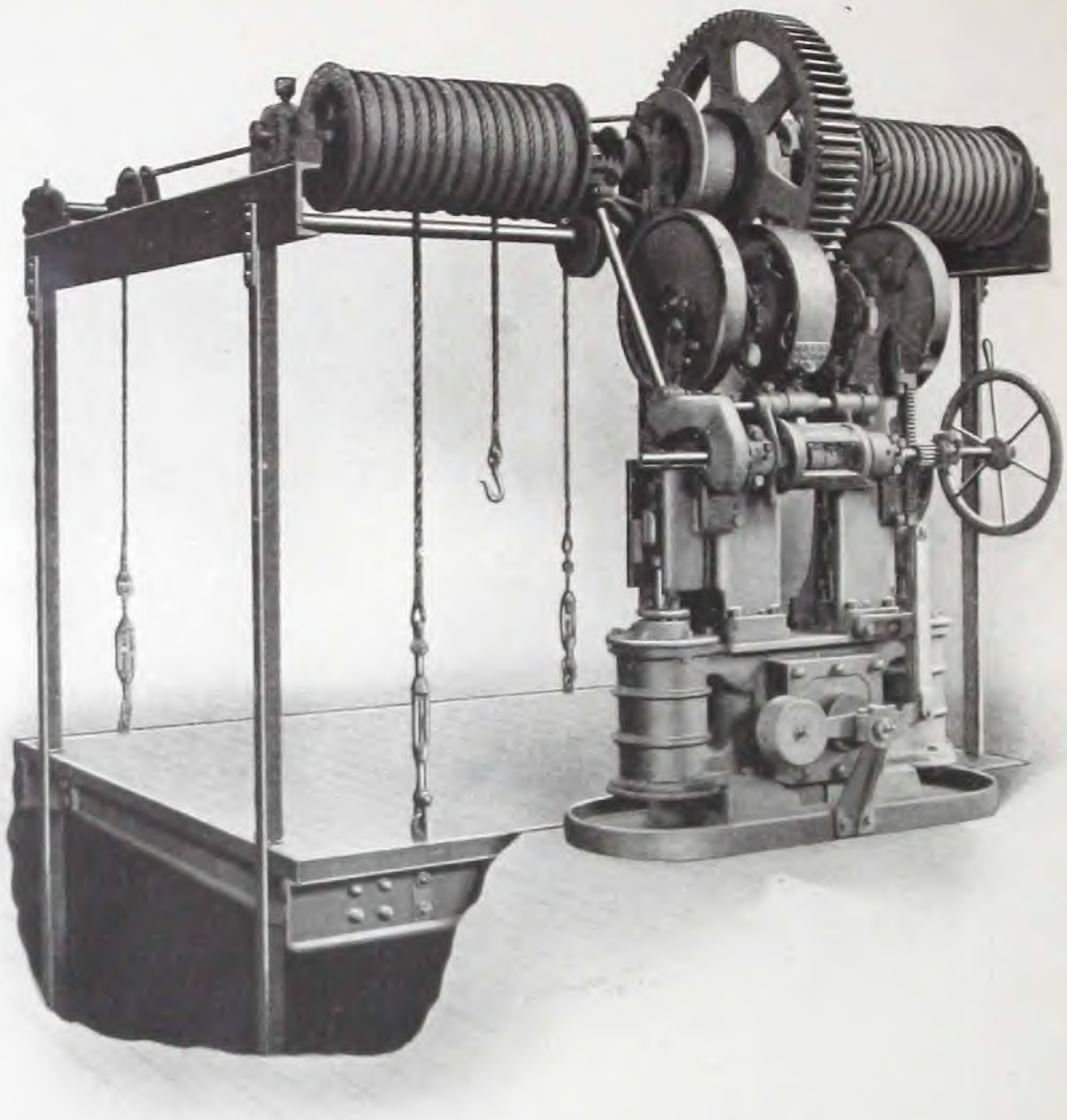


Fig. 25. Steam Hoist for Use on Board Ship.

S T E A M H O I S T

FOR USE ABOARD SHIP.

FIGURE Twenty-five shows a new type of Steam Hoist designed particularly for use on board ships. A marked economy in loading and unloading has resulted in those vessels where these hoists have been installed. The particular hoist illustrated herewith has a capacity of 4,000 pounds net load at a speed of 100 feet per minute, the size of the platform being seven by ten feet. Hoists of this character, however, can be made with any desired rating.

The engine can be fitted with an automatic device whereby, at the beginning of a loading operation, the engine is automatically brought to a stop when the platform reaches the lowest deck. When this deck is completely loaded, the device is readjusted to stop the engine automatically, when the platform is lowered to the next deck, and so on. When all the decks are completely loaded, the platform is lowered to the bottom of the hatchway. The main winding drums are then thrown out of gear and the auxiliary whip hoist, which can be seen in the illustration, becomes operative. The hatchway may then be filled with cargo by means of this auxiliary hoist. In unloading, these operations are, of course, reversed.

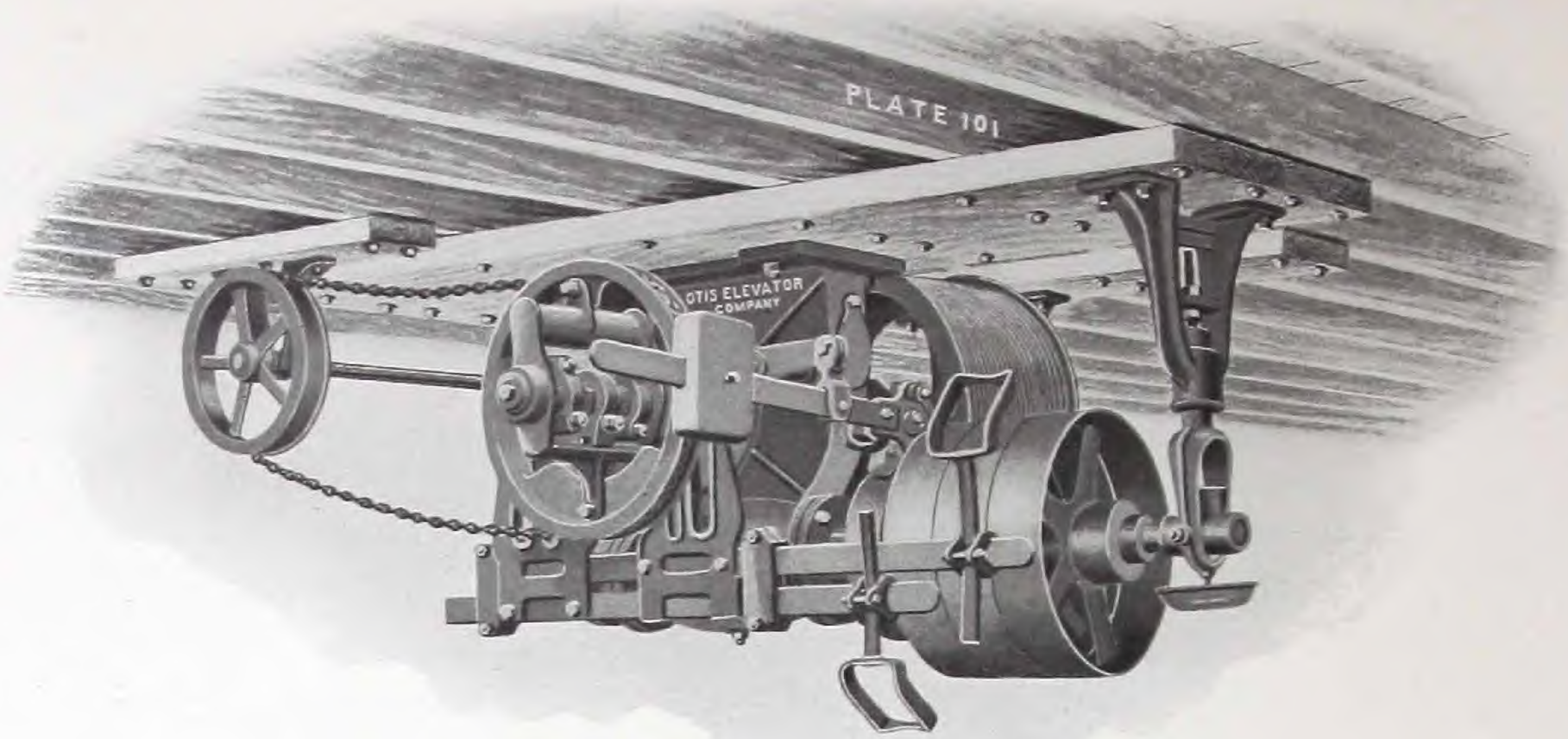


Fig. 26. Double-Belt Ceiling Machine.

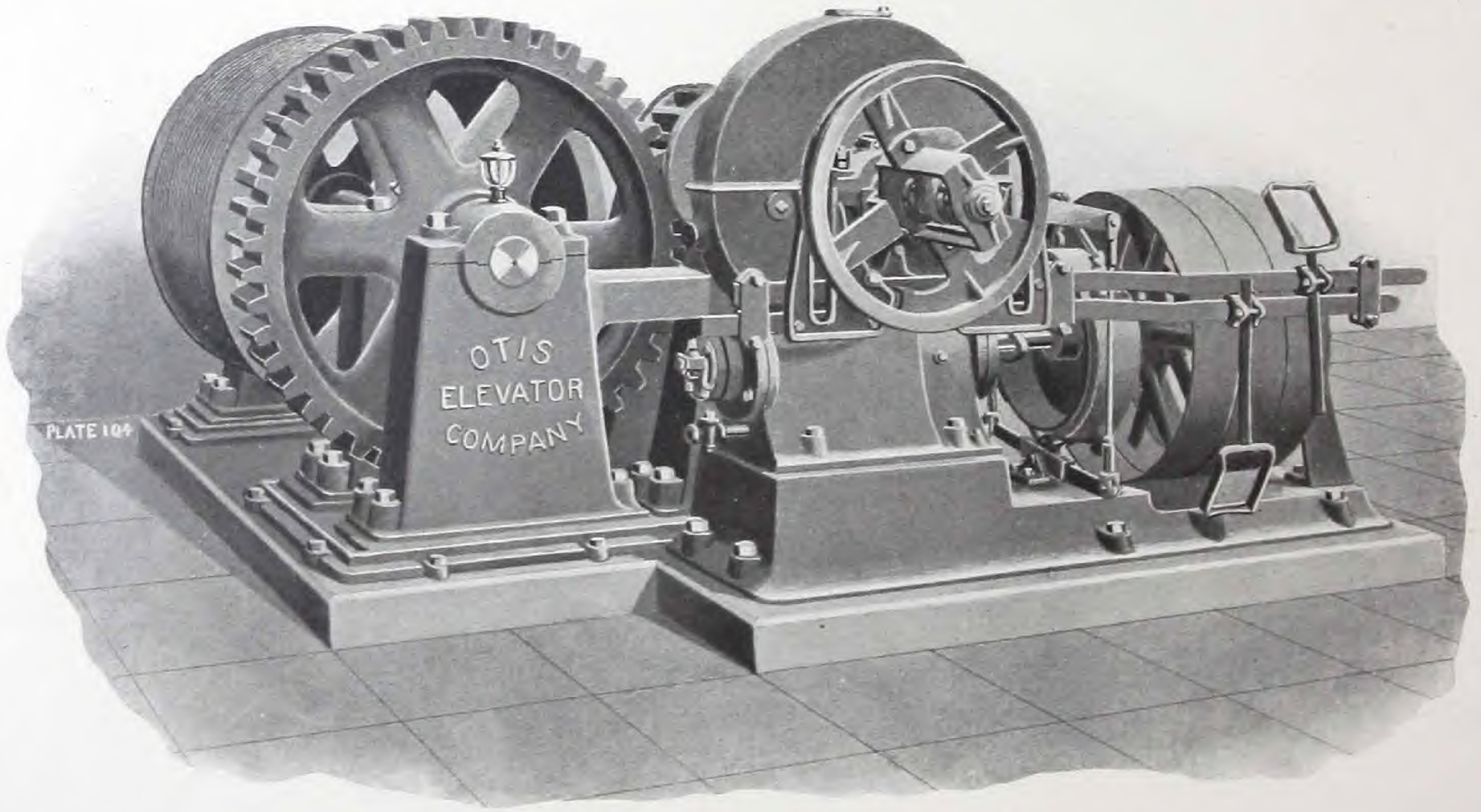


Fig. 27. Double-Belt Machine for Heavy Duty.

DOUBLE-BELT ELEVATORS

THIS is one of the oldest types of Freight Elevator Engines and is driven by belts from a line shaft, or by a gas engine or electric motor through a countershaft. A large number of elevators of this type are used on account of the comparatively low cost and where individual motive power for the elevator is not feasible or desired. The engine is usually attached to the ceiling, as shown in Figure Twenty-six.

This type is made in sizes to suit capacities up to 6,000 pounds, and special machines with combined worm and spur gears are built for much heavier duty. A double-belt machine so constructed — intended to be installed upon the floor — is shown in Figure Twenty-seven.

ELECTRIC WHIP HOIST

FIGURE Twenty-eight shows the Otis Electric Whip Hoist, which is designed for light and rapid hoisting for stores, warehouses, etc. The friction sheave is engaged with the lifting drum sheave by simply pulling the lever upward, and the machine can be operated and controlled from any distance. The moment the lever is released the break is automatically applied, holding the load at the desired point. The hoist can be furnished with a special automatic control, which prevents the operator from running the hoist or raising the load beyond a terminal point of travel that may be fixed.

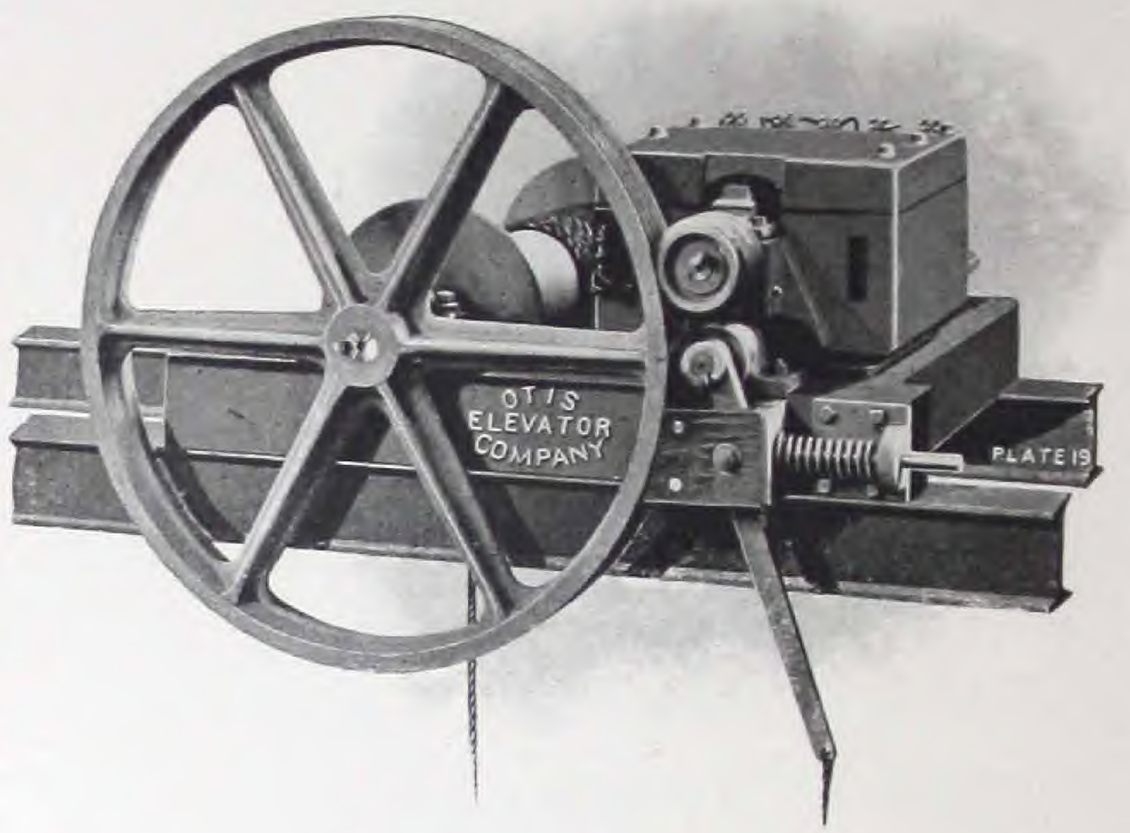


Fig. 28. Electric Whip Hoist.

Electric Dock Hoist—Hydraulic Ash Hoist

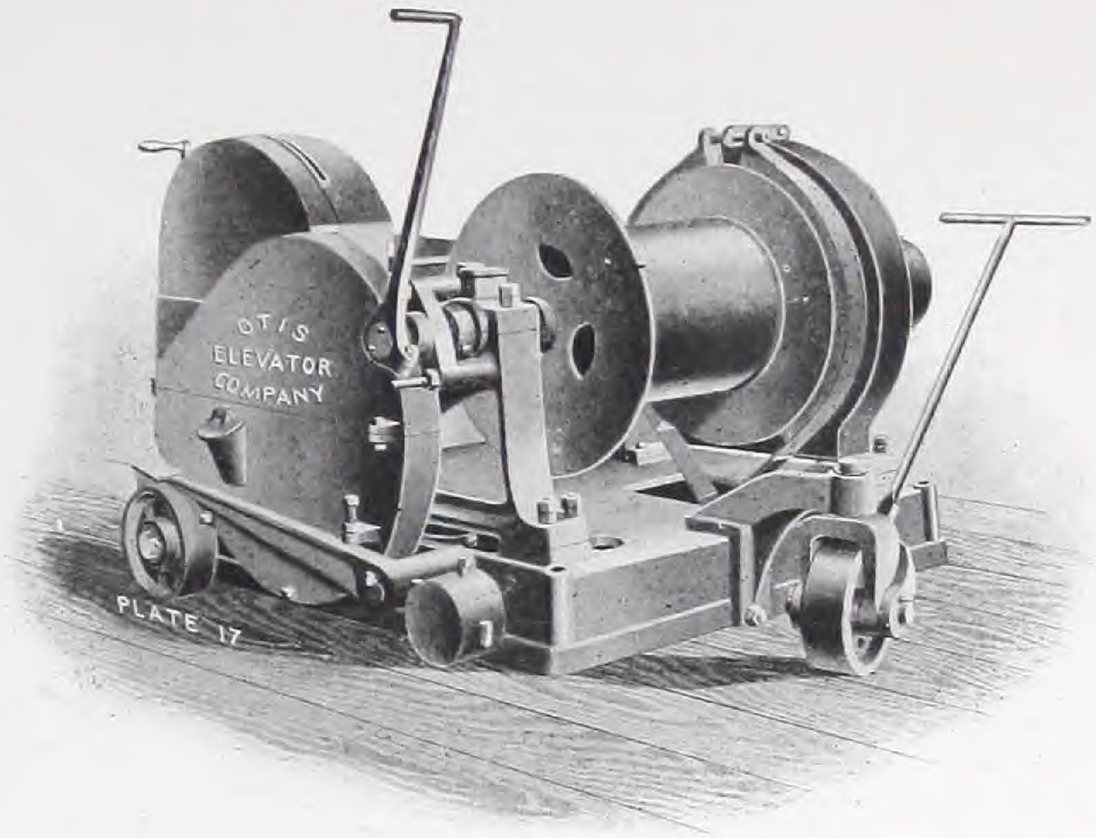


Fig. 29. Electric Dock Hoist.

FIGURE Twenty-nine shows the Otis Electric Portable or Stationary Hoisting Engine. In using it as a stationary engine the wheels are removed and the engine bolted to foundation. The "V" clutch and powerful band brake give perfect control of the engine in hoisting and lowering at variable speeds. The machine has been so constructed as to give the greatest economy in operation and maintenance.

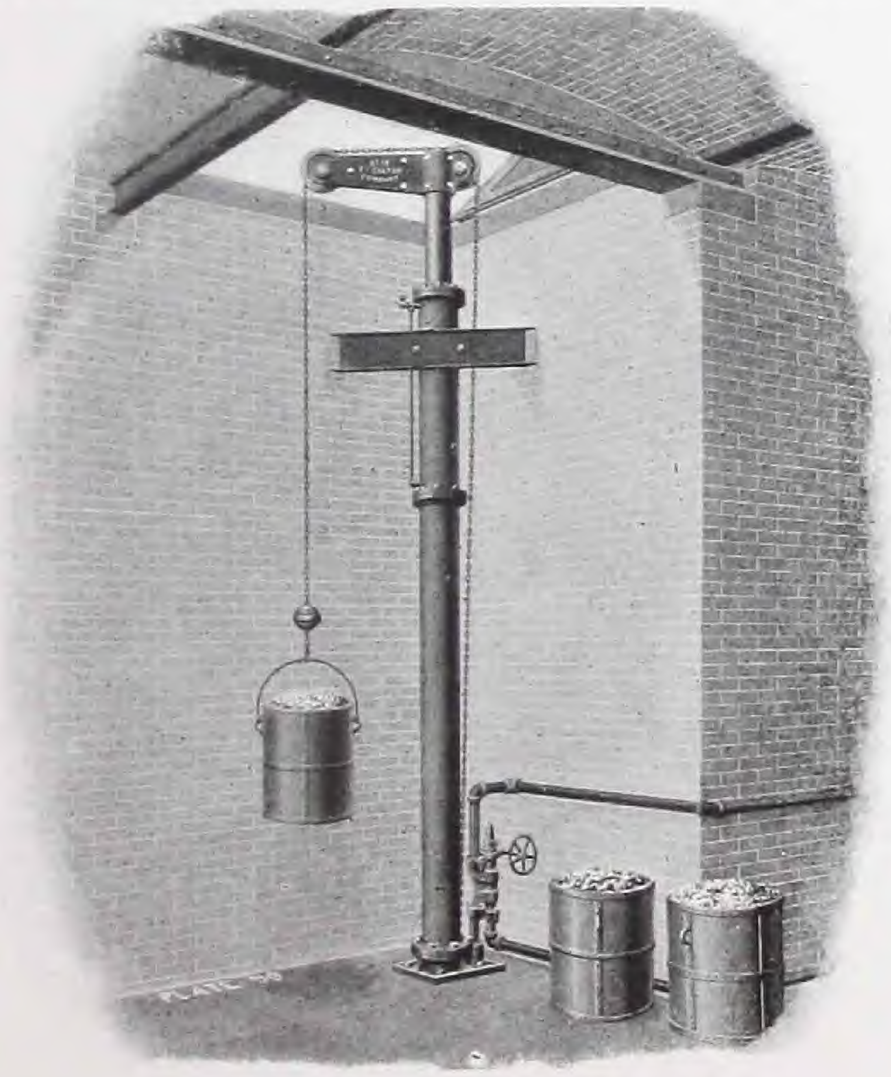


Fig. 30. Hydraulic Ash Lift.

FIGURE Thirty shows the Otis Hydraulic Ash Hoist, for raising ashes, etc., from the cellar to the sidewalk. The extreme simplicity of construction and operation and the extraordinary compactness strongly recommend this type of hoist for this class of service.

THE ESCALATOR

Fig. 31. Escalators in the Store of Messrs. R. H. Macy & Co., New York.

Showing the upper landing of the first Escalator and the second Escalator in the background. The ample space allowed in which to step from the Escalator is clearly shown, and the moving hand rails and the shunt may also be seen. The Escalators serving the upper floors are located above the second Escalator.

THE ESCALATOR

IN certain situations, the Escalator is the ideal device for conveying large numbers of people from one level to another. Its extraordinary capacity — 10,000 people per hour — renders it particularly adaptable for service in department stores, railroad terminals, and underground and elevated railway stations. The Escalator is a continuous carrier, and as such it possesses advantages which may briefly be stated as follows:

"The elevator door is always open."

The various units or steps composing the Escalator when in view are always absolutely horizontal. At the upper and lower landings the steps travel in the same horizontal plane, their treads alone being exposed, during an interval sufficiently long for the passenger, no matter what his age or infirmity, to board the device with ease before the ascent begins or to step therefrom at the conclusion of the ascent. Should the passenger neglect, for any reason, to step off at the top, he is gently brushed therefrom by a device known as the shunt, which is shown in the vignette. A traveling hand rail at each side of the Escalator, moving at the same rate as the steps, is provided for the convenience of those accustomed to using a hand rail on stationary stairways.

Detailed information about the Escalator, with illustrations of various installations, is contained in a special Escalator catalogue, and those desiring further information should write for this booklet.

ESCALATOR AT PARIS EXPOSITION

Fig. 32. Escalator at the Paris Exposition.

This Machine was Awarded the Grand Prix.

OTIS ELEVATOR AND EIFFEL TOWER

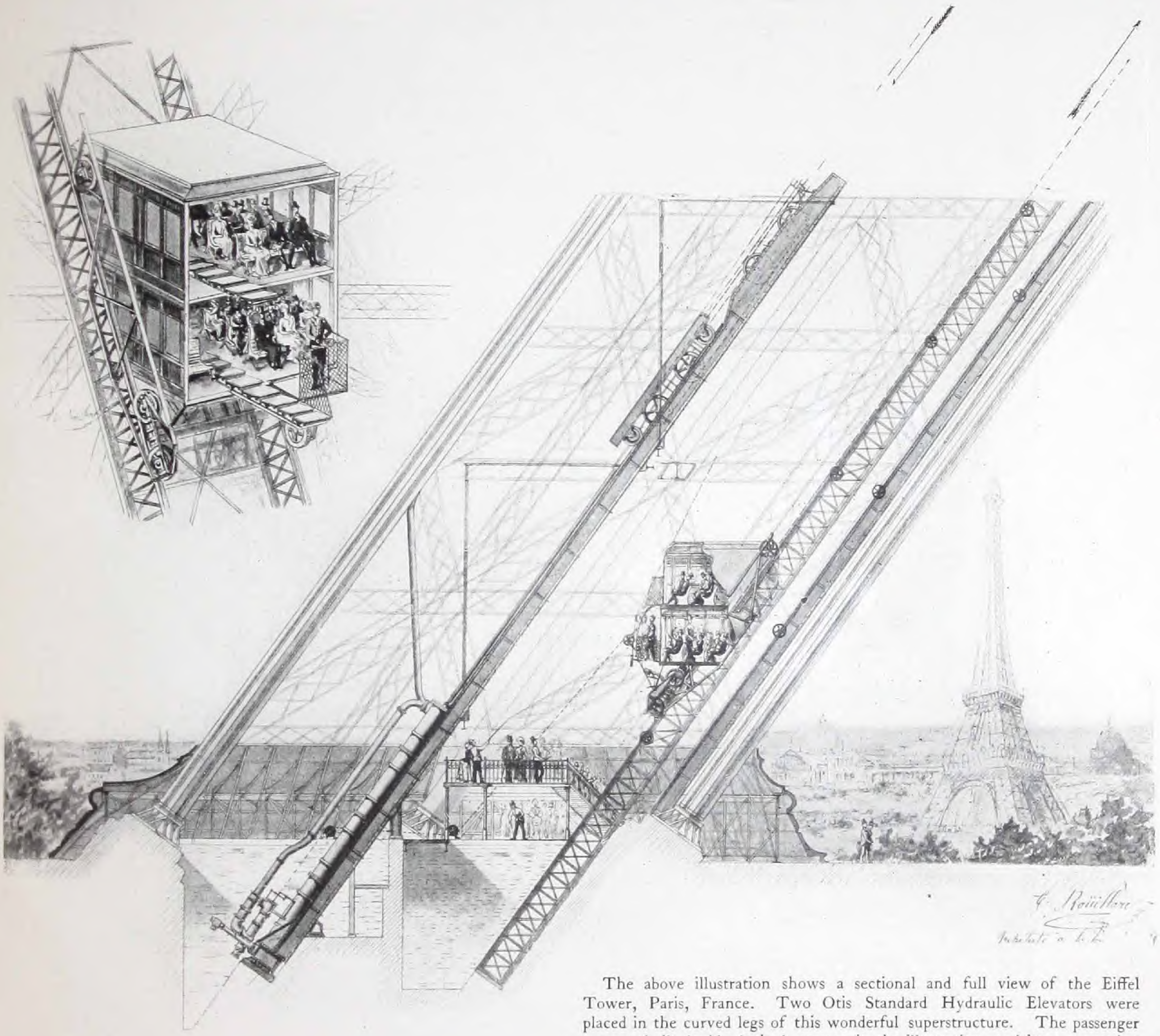


Fig. 33. Eiffel Tower.

The above illustration shows a sectional and full view of the Eiffel Tower, Paris, France. Two Otis Standard Hydraulic Elevators were placed in the curved legs of this wonderful superstructure. The passenger cars are built double-decked, as seen in the illustration, and have a carrying capacity of fifty people at a speed of from 400 to 600 feet per minute. The power employed is the hydraulic-pressure tank system.

INCLINE RAILWAY

CATSKILL MOUNTAIN.

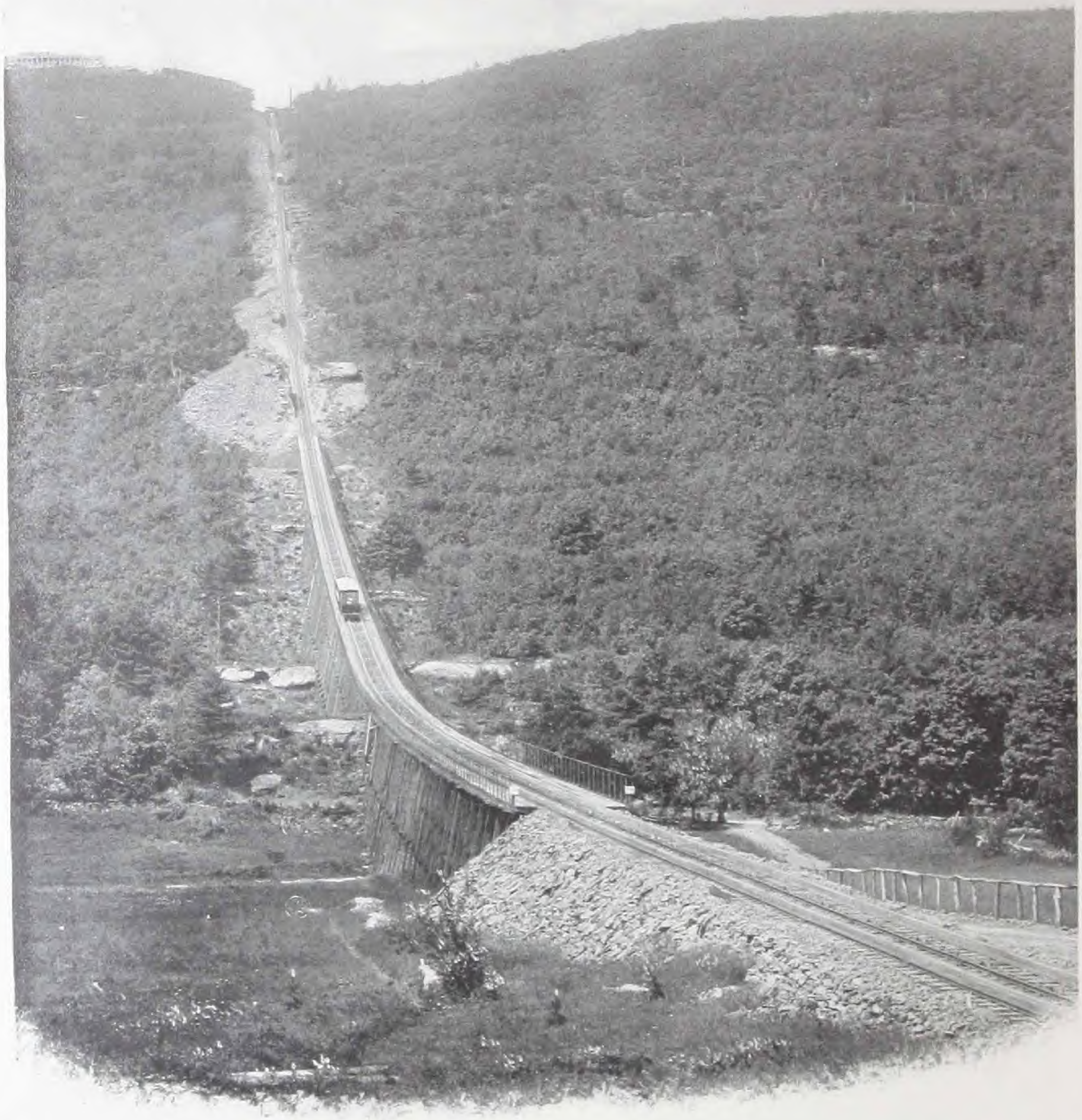


Fig. 34. Catskill Mountain Incline Railway.

INCLINE RAILWAY

CATSKILL MOUNTAIN.

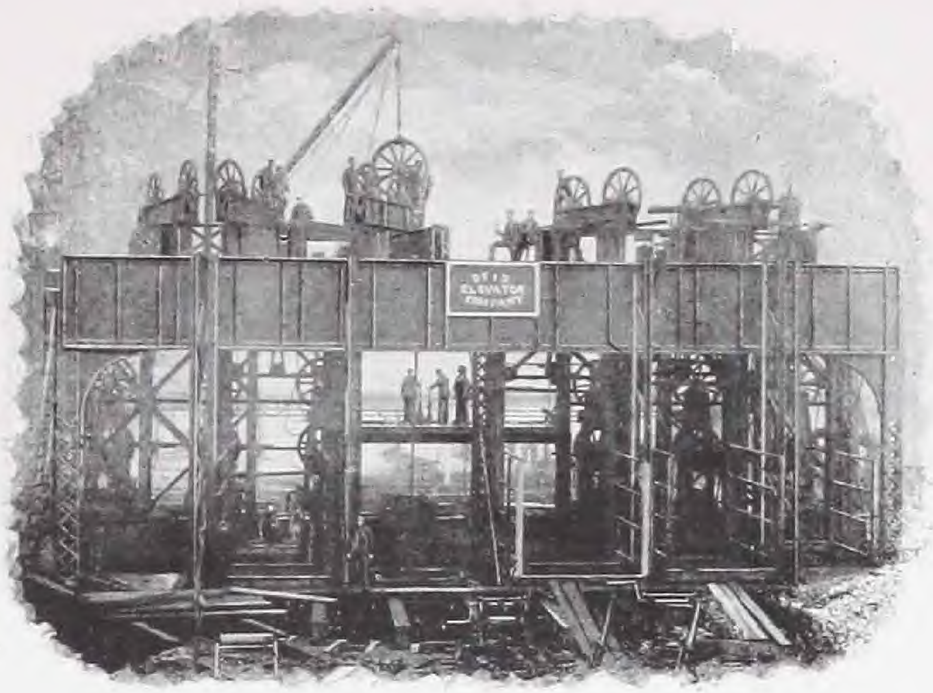
THE Catskill Mountain Incline Railway, which we illustrate on page 54, was built by this company, in 1892. The distance traveled is one and a half miles, a rise of 1,630 feet, maximum grade 40 per cent. The road is the three-rail system with a double-track turnout at the central point, enabling the running of two trains in opposite directions. The carrying capacity is 100 people, including baggage, at a speed of eight miles per hour. The power employed is steam, having two Corliss Engines located at the upper terminal of the railway, connected to the cars by heavy lifting cables.

We also give a glimpse, in the two small vignettes on this page, of the Lake George Incline Railway. This incline railway is about 7,000 feet long, a rise of 1,600 feet, maximum grade 46 per cent. The motive power is steam, using two Otis Duplex Engines. The carrying capacity is sixty people, at a speed of eight miles per hour.

Depot Entrance, Glasgow Harbor Tunnel

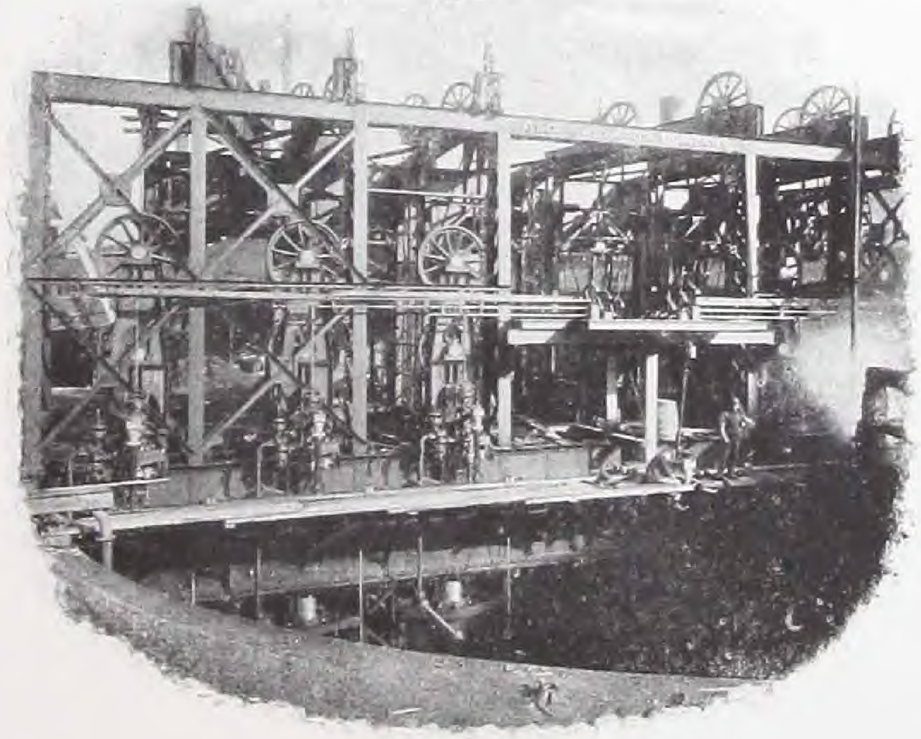
Fig. 35. Depot Entrance, Glasgow Harbor Tunnel.

Depot Entrance, Glasgow Harbor Tunnel



THE opposite illustration shows the entrance depot to Glasgow Harbor Tunnel Elevators, built and erected by the Otis Elevator Company, New York. The plant consists of twelve elevators, having a car travel of eighty feet. Platforms are ten feet wide by twenty-eight feet long, giving a lifting capacity for wagon and team of horses at a car speed of 250 feet per minute. The elevators are operated under our high pressure hydraulic system, using steam pumps and accumulators. The hydraulic pressure being 800 pounds.

In the small vignettes we show the work under process of construction.



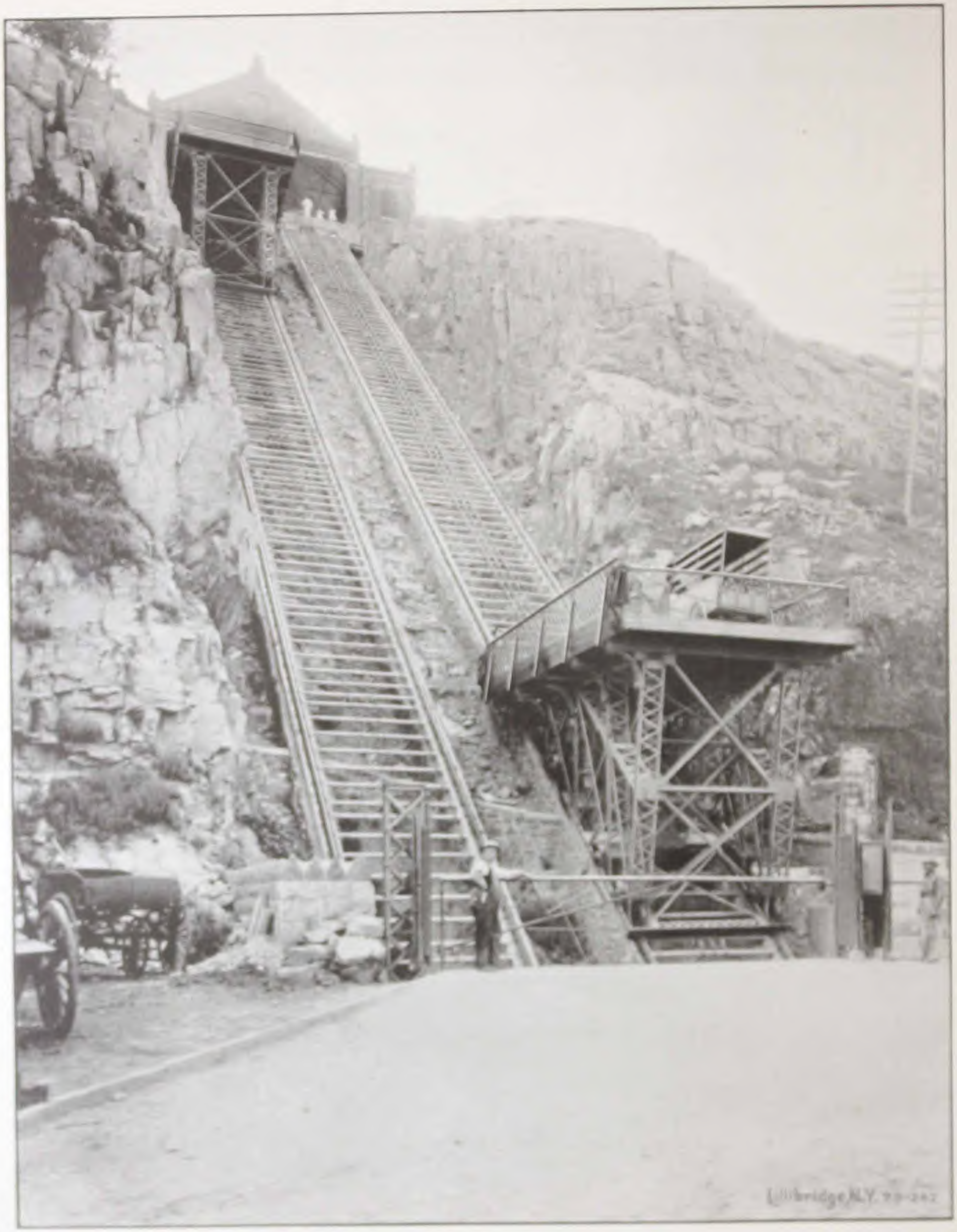


Fig. 36. Weehawken Incline Railway.

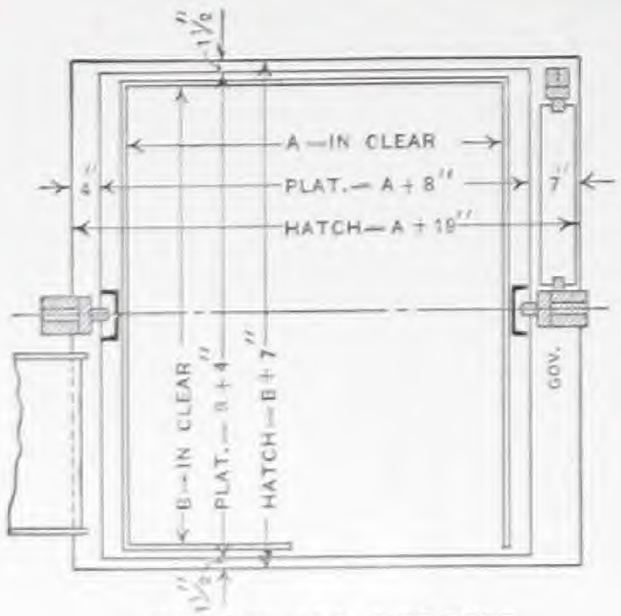
WEEHAWKEN INCLINE RAILWAY

FIGURE Thirty-six shows the Weehawken Incline Double Track Railway, built by the Otis Elevator Company. The cars for passengers and vehicles are twenty feet wide by forty feet long, capable of carrying a load of 50,000 pounds at a car speed of 300 feet per minute. The engines are electric and operated by 300 horse-power motors. The height of travel of this incline is 300 feet; grade 72 per cent.

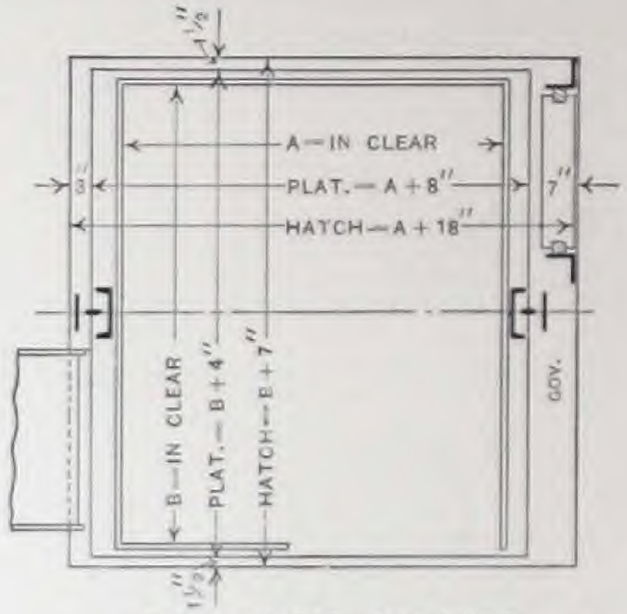
We furnish, upon application, preliminary sketches and approximate cost of inclined railways for all requirements, and for both passenger and freight service.

DIMENSION DIAGRAM PASSENGER ELEVATORS

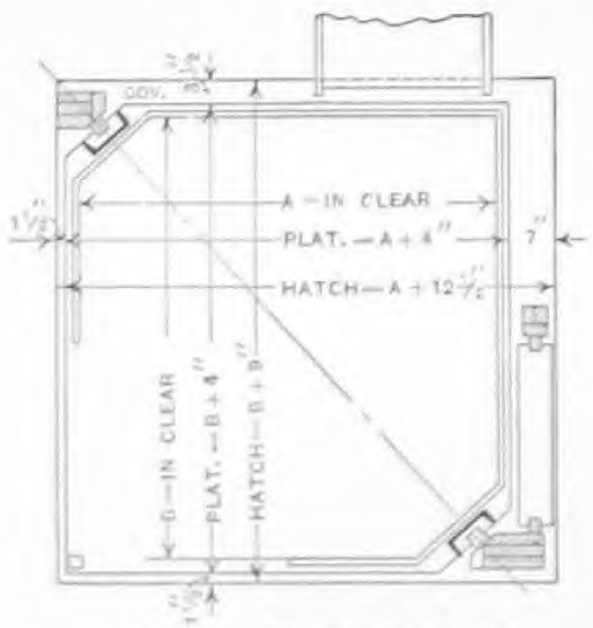
SHOWING RELATION OF HATCHWAY, PLATFORM, AND CAR SIZES.



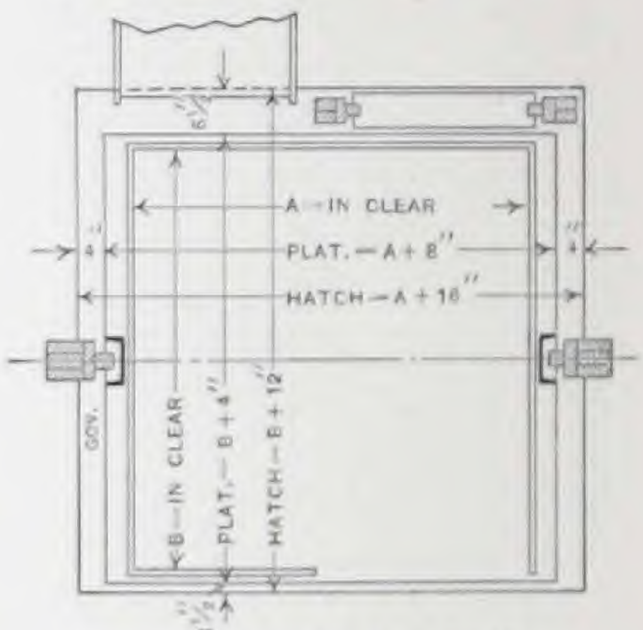
WOOD GUIDES. SIDE POST.
MACHINE AND COUNTERWEIGHT AT SIDE.



STEEL GUIDES. SIDE POST.
MACHINE AND COUNTERWEIGHT AT SIDE.

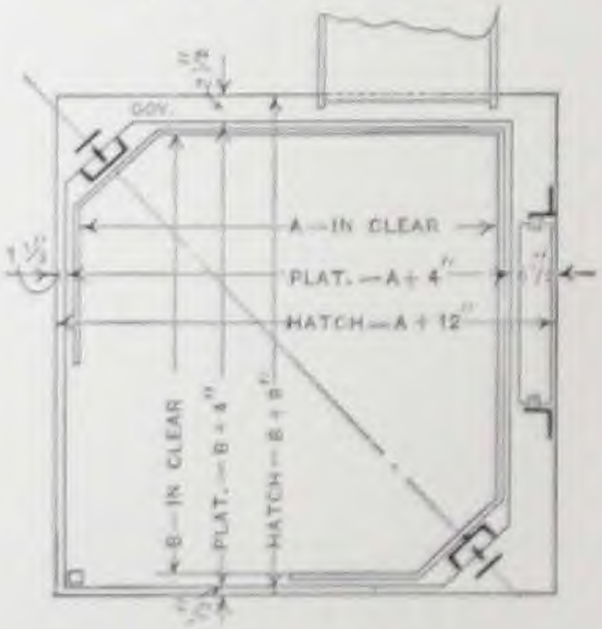


WOOD GUIDES. CORNER POST.
MACHINE AT BACK OR OVERHEAD.
COUNTERWEIGHT AT SIDE.



WOOD GUIDES. SIDE POST.
MACHINE AND COUNTERWEIGHT AT BACK
OR MACHINE OVERHEAD.

STEEL GUIDES. SIDE POST.
MACHINE AND COUNTERWEIGHT AT BACK
OR MACHINE OVERHEAD.



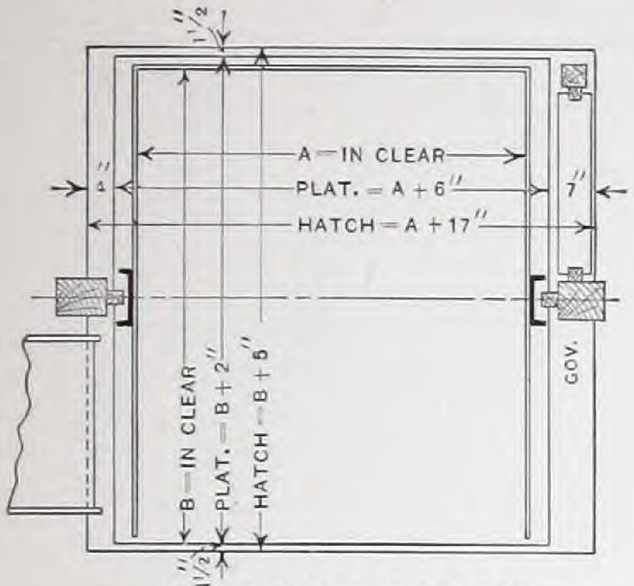
STEEL GUIDES. CORNER POST.
MACHINE AT BACK OR OVERHEAD.
COUNTERWEIGHT AT SIDE.

Scale $\frac{1}{4}'' - 1'$

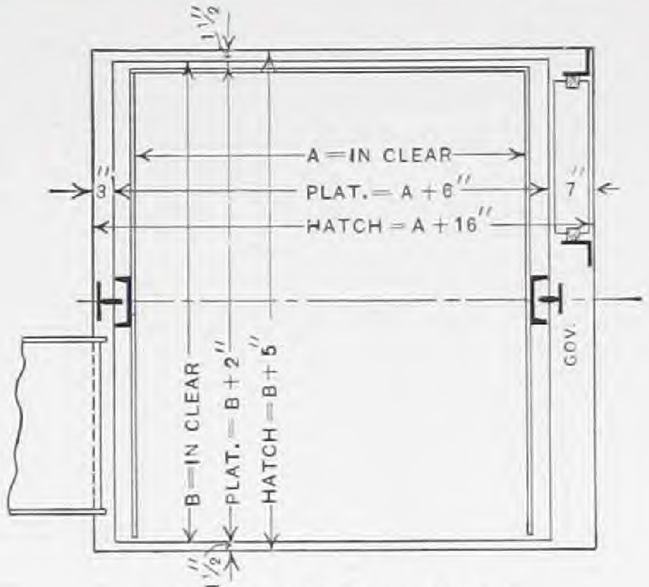
DIMENSION DIAGRAM FREIGHT ELEVATORS

WITH STEEL PLATFORM,

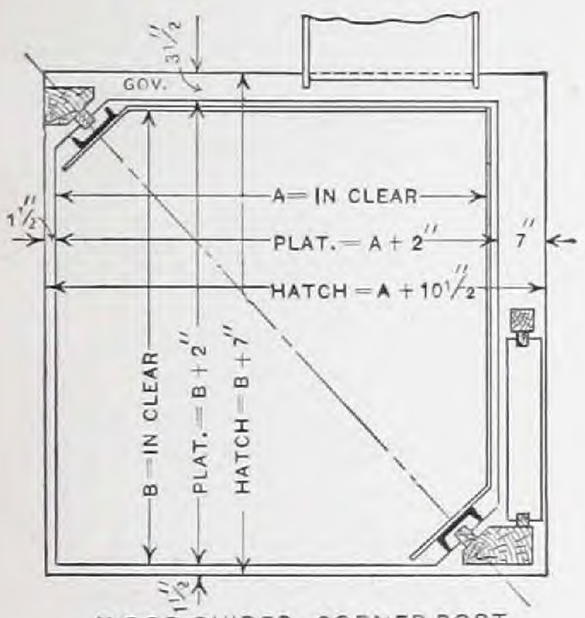
SHOWING RELATION OF HATCHWAY, PLATFORM, AND CAR SIZES.



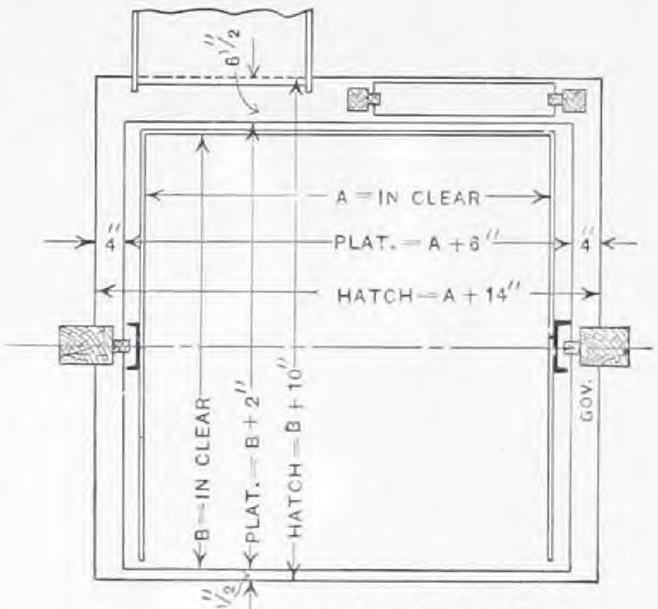
WOOD GUIDES, SIDE POST.
MACHINE AND CWT. AT SIDE.



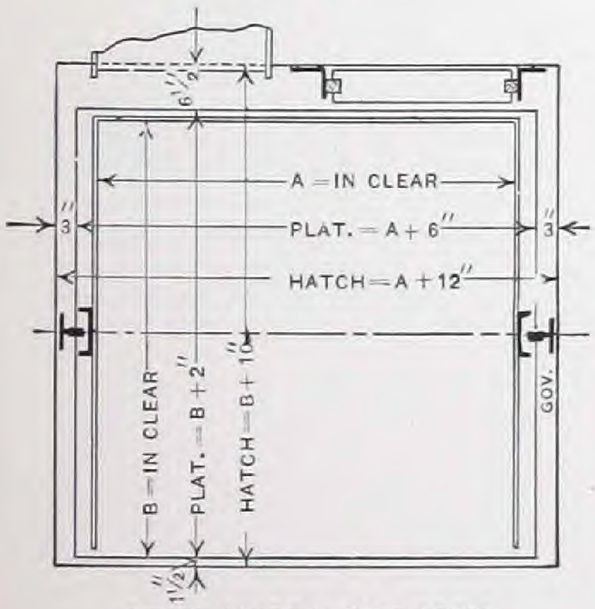
STEEL GUIDES. SIDE POST.
MACHINE AND CWT. AT SIDE.



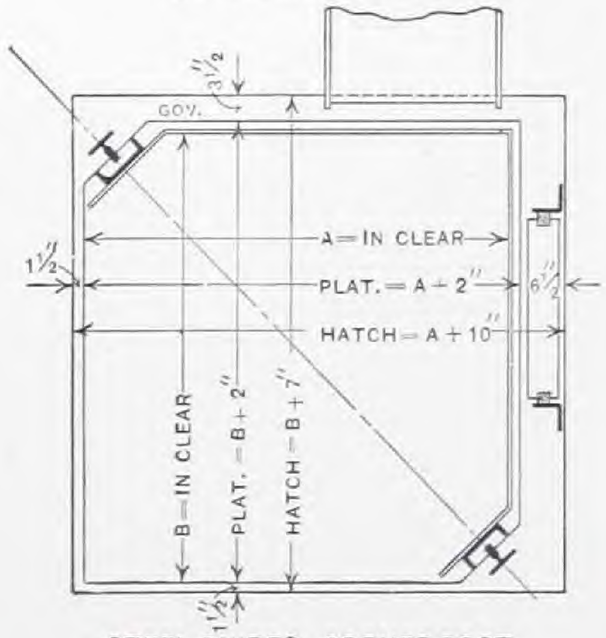
WOOD GUIDES. CORNER POST.
MACHINE AT BACK OR OVER HEAD.
CWT. AT SIDE



WOOD GUIDES. SIDE POST.
MACHINE AND CWT. AT BACK
OR MACHINE OVER HEAD.



STEEL GUIDES. SIDE POST.
MACHINE AND CWT. AT BACK
OR MACHINE OVERHEAD.



STEEL GUIDES. CORNER POST.
MACHINE AT BACK OR OVERHEAD.
CWT. AT SIDE.

Scale ¼ = 1

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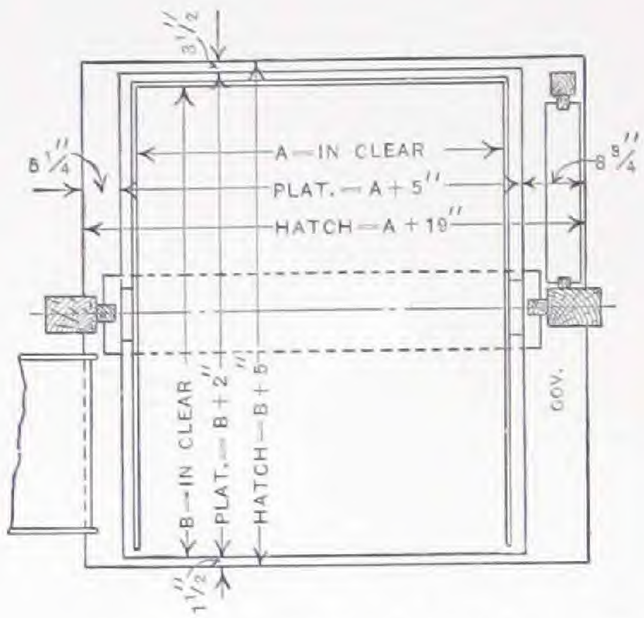
DIMENSION DIAGRAM FREIGHT ELEVATORS

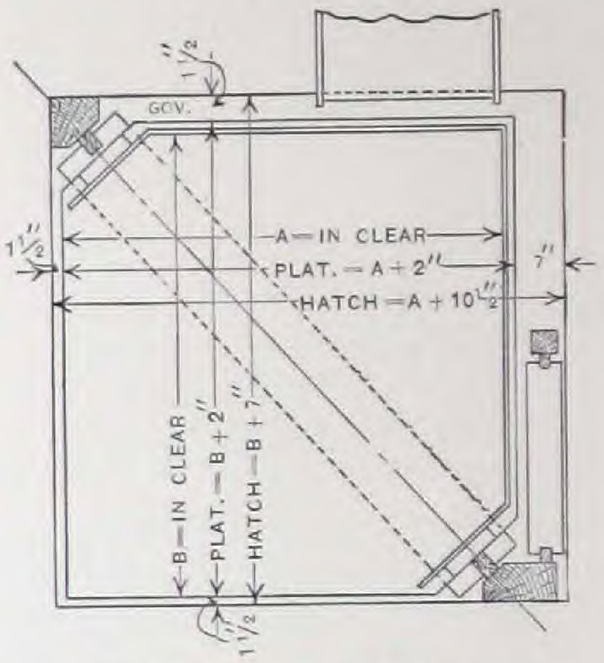
WITH WOOD PLATFORM,

SHOWING RELATION OF HATCHWAY, PLATFORM, AND CAR SIZES.

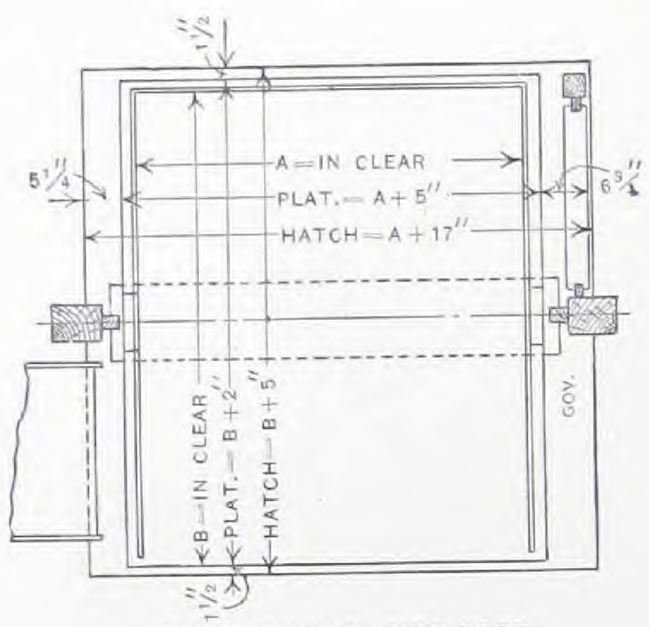


WOOD GUIDES. SIDE POST.
MACHINE AND COUNTERWEIGHT
AT SIDE.

FOR SINGLE BELT CEILING MACHINE
OR DIRECT ELECTRIC "

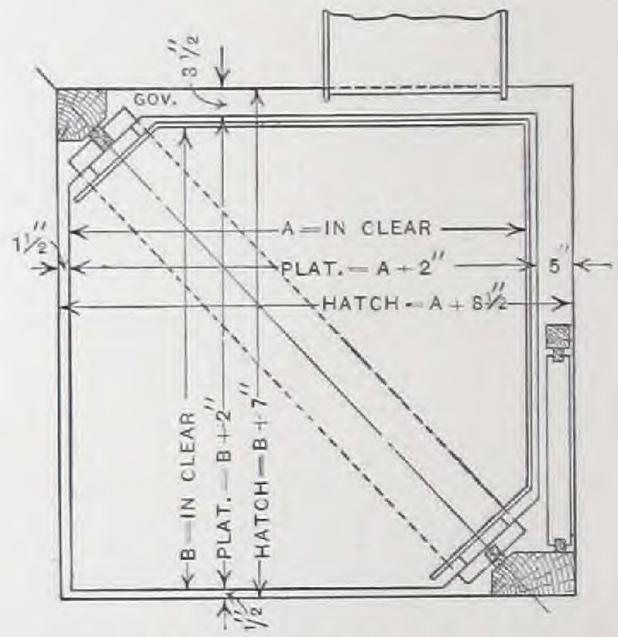


WOOD GUIDES. CORNER POST.
MACHINE AT BACK OR DIRECT ELECTRIC.
COUNTERWEIGHT AT SIDE.



WOOD GUIDES. SIDE POST.
MACHINE AND COUNTERWEIGHT
AT SIDE.

FOR DOUBLE BELT CEILING MACHINE



WOOD GUIDES. CORNER POST.
MACHINE AT BACK.
COUNTERWEIGHT AT SIDE.

Scale 1/4" – 1'

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